Microsoft®

Microsoft® Excel

Reference

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Microsoft® Excel Reference

Complete Spreadsheet with Business Graphics and Database
Version 2.2

For the Apple® Macintosh®

Microsoft Corporation

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Document Number AB0202-220-R00-0289
Part Number 05618

Contents

Introduction 1
About Excel command 4
Absolute reference 5
Alignment 5
Array 10
Auditing worksheet models 24
Borders and shading 28
Calculation 31
Chart 36
Chart Add Arrow command 55
Chart Add Legend command 55
Chart Add Overlay command 56
Chart area 56
Chart arrow 57
Chart Attach Text command 59
Chart Axes command 60
Chart axis 60
Chart Calculate Now command 66
Chart data series 66
Chart Delete Arrow command 78
Chart Delete Legend command 79
Chart Delete Overlay command 79
Chart Full Menus command 80
Chart Gridlines command 80
Chart legend 81
Chart plot area 83
Chart Protect Document command 84
Chart Select Chart command 85
Chart Select Plot Area command 86
Chart Short Menus command 86
Chart text 87
Chart Unprotect Document command 95
Circular reference 95
Color 96
Column 97
Command, menu, and dialog box 101
Constant value 110
Convergence 111
Copying data and formats 111
Data Delete command 125
Data Exit Find command 126
Data Extract command 126

Data Find command 128
Data Form command 129
Data Parse command 132
Data Series command 133
Data Set Criteria command 135
Data Set Database command 136
Data Sort command 136
Data table 138
Data Table command 148
Database 148
Date 179
Default settings 186
Deleting a document 193
Deleting and clearing data 194
Display options 197
Divergence 204
Edit Clear command 205
Edit Copy command 207
Edit Copy Picture command 208
Edit Cut command 210
Edit Delete command 211
Edit Fill Down command 212
Edit Fill Left command 212
Edit Fill Right command 213
Edit Fill Up command 213
Edit Insert command 214
Edit Paste command 215
Edit Paste Link command 217
Edit Paste Special command 218
Edit Repeat command 222
Edit Undo command 223
Editing a document 223
Error value 235
Exchanging data between applications 241
External reference 249
Features and specifications 249
File Close All command 258
File Close command 259
File Delete command 260
File Links command 262
File New command 263
File Open command 264
File Open Mail command 266
File Page Setup command 267
File Print command 270
File Quit command 273
File Record Macro command 274
File Save As command 274

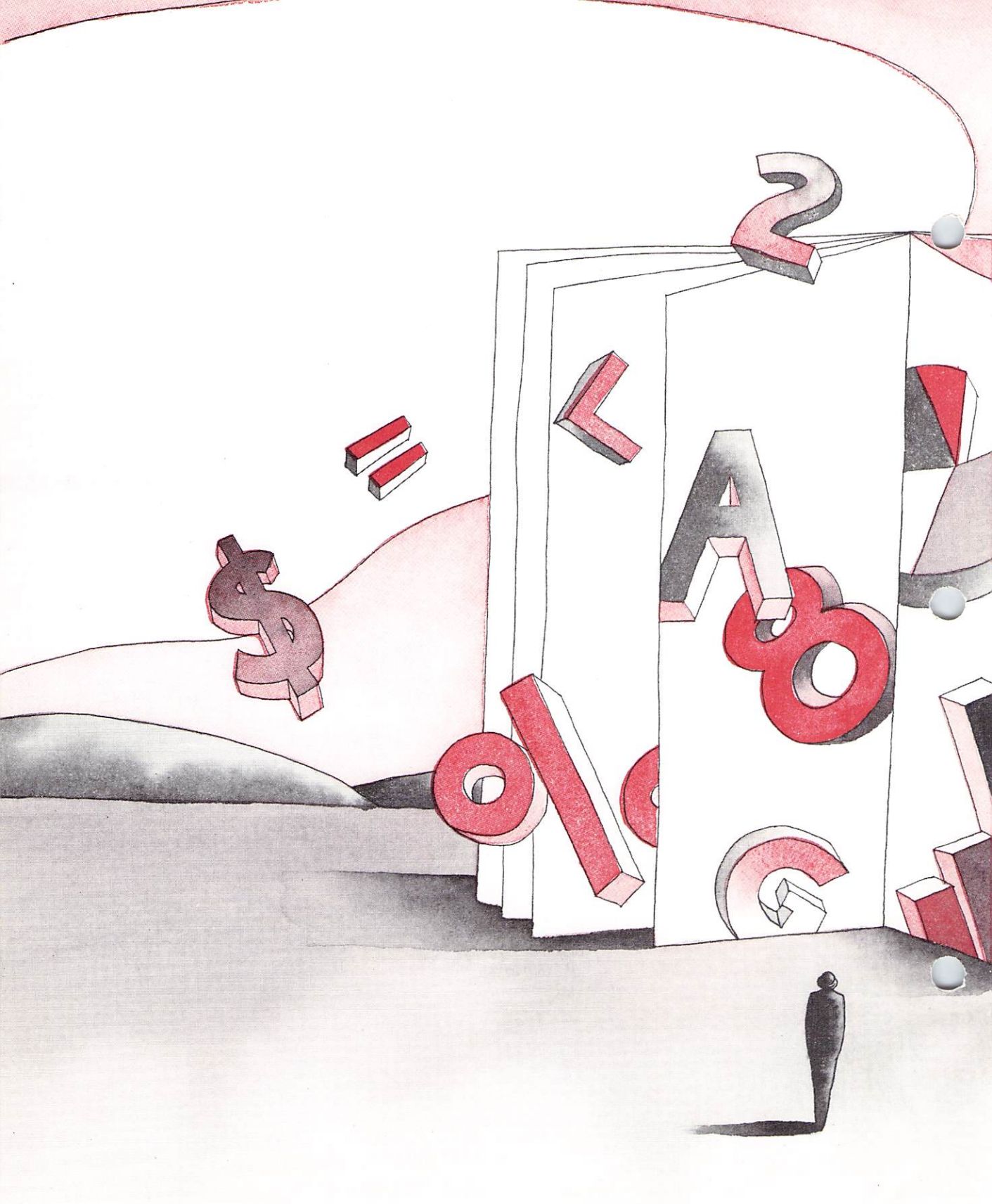
File Save command 277
File Save Workspace command 278
File Send Mail command 279
Finding cells and data quickly 280
Folders 286
Font 289
Format Alignment command 292
Format Border command 293
Format Cell Protection command 294
Format Column Width command 295
Format Font command 296
Format Justify command 299
Format Legend command 300
Format Main Chart command 301
Format Move command 302
Format Number command 303
Format Overlay command 308
Format Patterns command 310
Format Row Height command 315
Format Scale command 315
Format Size command 318
Format Text command 319
Formatting a document 320
Formula 337
Formula Apply Names command 341
Formula bar 344
Formula Create Names command 349
Formula Define Name command 350
Formula Find command 353
Formula Goto command 354
Formula Note command 355
Formula Paste Function command 356
Formula Paste Name command 357
Formula Reference command 358
Formula Replace command 359
Formula Select Special command 361
Formula Show Active Cell command 365
Function 365
Gallery Area command 377
Gallery Bar command 378
Gallery Column command 379
Gallery Combination command 380
Gallery Line command 381
Gallery Pie command 382
Gallery Preferred command 383
Gallery Scatter command 383
Gallery Set Preferred command 384
Hardware and system configuration 385

Headers and footers 388
Help 391
Info Cell command 396
Info Dependents command 397
Info Format command 398
Info Formula command 398
Info Names command 399
Info Note command 399
Info Precedents command 400
Info Protection command 401
Info Value command 401
Info window 402
Inserting blank cells 410
Insertion point 412
Iteration 412
Keyboard 416
Linking documents 429
Logical value 442
Lookup table 442
Lotus 1-2-3 445
Macro 454
Macro Absolute Record command 461
Macro Record command 461
Macro Relative Record command 462
Macro Run command 463
Macro Set Recorder command 463
Macro sheet 464
Macro Start Recorder command 464
Macro Stop Recorder command 465
Memory management 466
Menu and menu bar 469
Microsoft Excel for Windows 471
Microsoft Excel version 1.5 471
Microsoft Mail 479
Mixed reference 481
Moving data on a worksheet 481
Multiple selection 485
Names 485
Networks with Microsoft Excel 494
Notes 498
Number 504
One-input table 513
Opening a document 513
Operator 515
Options Calculate Document command 519
Options Calculate Now command 519
Options Calculation command 520
Options Display command 523

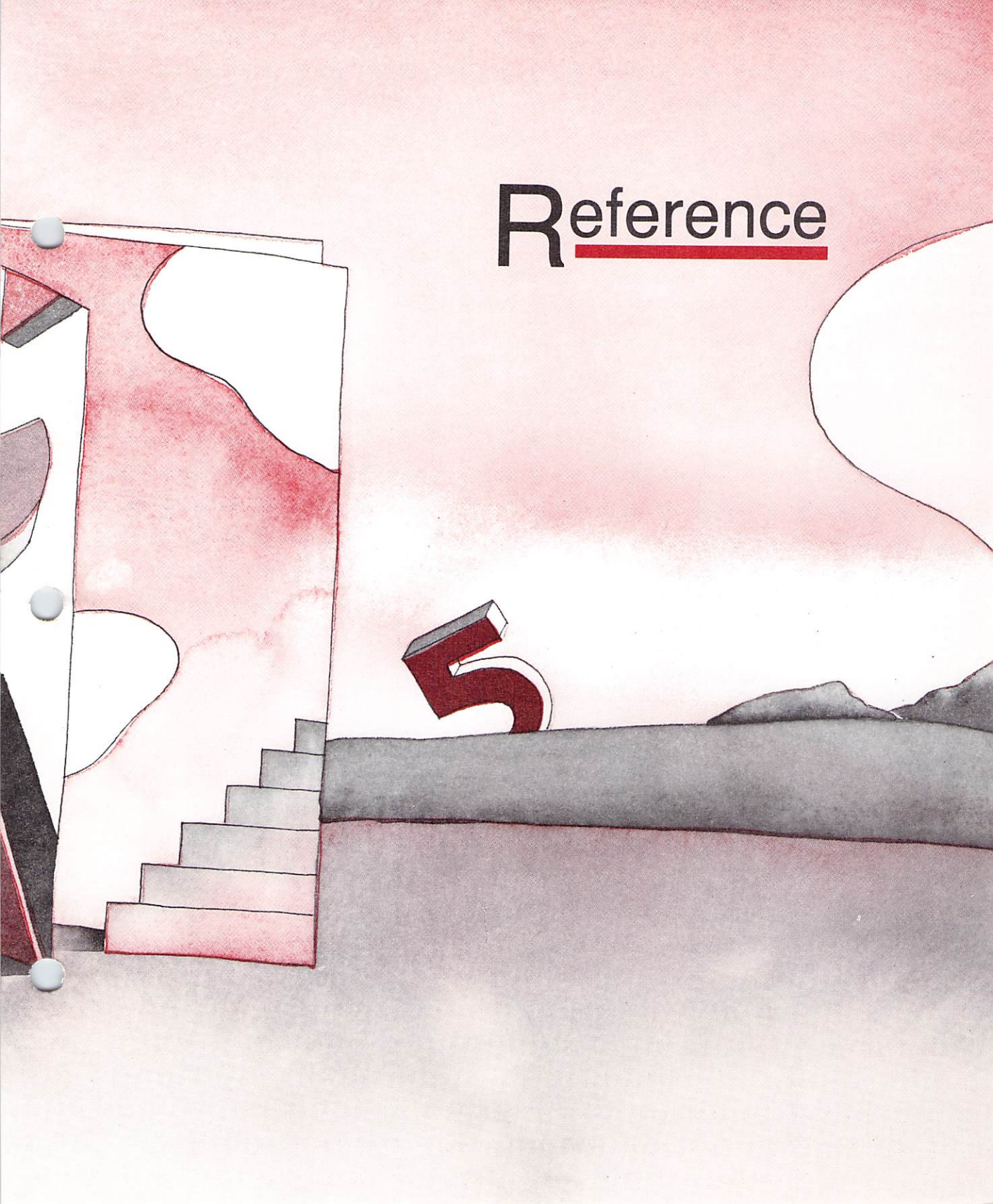
Options Freeze Panes command 524
Options Full Menus command 525
Options Protect Document command 525
Options Remove Page Break command 527
Options Set Page Break command 527
Options Set Print Area command 528
Options Set Print Titles command 528
Options Short Menus command 529
Options Standard Font command 530
Options Unfreeze Panes command 531
Options Unprotect Document command 531
Options Workspace command 532
Overlay chart 534
Printing a document 538
Protecting or hiding data 548
Quitting Microsoft Excel 553
References 554
Relative reference 559
Row 560
Saving and closing a document 562
Scatter chart 567
Selection 572
Serial number 574
Series formula 575
Sorting data 580
Starting Microsoft Excel 582
Startup file 583
Status bar 584
Table 588
Text 589
Time 590
Two-input table 597
Values 597
Wildcard 602
Window Activate Window command 603
Window Arrange All command 604
Window Help command 604
Window Hide command 605
Window More Windows command 606
Window New Window command 606
Window Show Clipboard command 607
Window Show Document command 607
Window Show Info command 608
Window Unhide command 609
Windows 609
Worksheet 626
Workspace file 655

Index 659

Reference



Reference



Introduction

Microsoft Excel provides the automated business tools you need for your projections, calculations, data analysis, decision-making, and reporting:

- **Worksheets.** With Microsoft Excel worksheets you can design powerful, effective models and systems with accuracy and precision.
- **Charts.** A complete charting package makes it easy to visualize your worksheet data instantly, perform rapid analysis, and create custom presentation graphics.
- **Databases.** You can conveniently manage a database on a worksheet, using standard database operations or a data form, a tool that simplifies most database operations.
- **Macros.** With Microsoft Excel, you can create your own macros to automate frequently performed tasks, perform specialized calculations, and design custom applications.

About This Manual

Microsoft Excel Reference is a complete guide for using Microsoft Excel. This manual assumes that you have installed Microsoft Excel using the procedures in *Getting Started with Microsoft Excel.*

Microsoft Excel Reference is intended for Microsoft Excel users of all proficiency levels. Topics in this book are listed in alphabetical order. For example, for information on creating a worksheet, look under W for "Worksheet."

Microsoft Excel Reference contains four kinds of topics:

- **Core topics.** The core topics present essential concepts and step-by-step procedures you need to know to perform common tasks with Microsoft Excel. The core topics are a good place to start if you have finished the tutorial and want more information. The six core topics are:

  Chart

  Command, menu, and dialog box

  Database

  Help

  Windows

  Worksheet

  A core topic is identified by a colored rectangle at the edge of each page of the topic.

- **Task topics.** Task topics contain concepts, examples, and procedures for more specific tasks than the core topics. For example, if you want more information on ways to insert, delete, or format columns, you would look in the task topic **Columns.**
- **Command topics.** Command topics describe the basic operation of each command and each command's settings or options. Command topics are listed in alphabetical order by the name of the menu on which the command is found, then the command name. For example, the Save command on the File menu is in the F's under **File Save command.**
- **Glossary topics.** Glossary topics provide brief definitions of essential terms in Microsoft Excel, such as Constant value.

Where to Start

The following table lists topics you should read first. If you're new to Microsoft Excel or the Macintosh, you may find it helpful to start with the core topics (indicated by an asterisk) in the order they appear in the table.

To	See this topic
Learn to display menus and choose commands	* Command, menu, and dialog box
Learn to work with document windows	* Windows
Learn worksheet basics	* Worksheet
Learn chart basics	* Chart
Learn database basics	* Database
Learn to use online Help	* Help
See all commands	* Command, menu, and dialog box
Learn about a specific command	The corresponding command topic (alphabetized by menu name, then command name— for example, **File Open command**)
See a complete listing of features and specifications	Features and specifications
See a complete listing of default settings	Default settings
See a listing of required and optional hardware and system software	Hardware and system configuration

To	See this topic
Learn about command shortcut keys, special keys, and keyboard techniques	Keyboard

Notational Conventions

The following terms and notational conventions are used throughout this manual:

- **Keynames.** The names of keys are spelled out in this manual (for example, Shift, Command, Enter) with an initial capital letter. On your keyboard, the key caps may abbreviate the names or represent them differently. For example, the Command key is sometimes labeled with an apple symbol as well as the usual command symbol (⌘).
- **Key combinations and sequences.** A plus sign (+) used between two keynames indicates that those keys must be pressed at the same time. For example, "Press Command+S" means that you should hold down the Command key while you press the S key.
- **Direction keys.** The Direction keys are the 2, 4, 6, and 8 keys on the keypad or the four arrow keys on the extended keyboard. The name of the individual Direction key refers to the direction the key moves: the Down Arrow key (2 key on keypad), the Up Arrow key (8 key on keypad), the Left Arrow key (4 key on keypad), or the Right Arrow key (6 key on keypad).
- **Return and Enter keys.** The Return key on the standard keyboard and the Enter key on the keypad perform the same action in Microsoft Excel, unless specifically stated otherwise. The word Enter is used throughout this manual to indicate that you can press either the Return key or the Enter key.
- **Italics.** *Italics* indicate words and characters you type. Titles of books also appear in italics.
- **Numbered lists and boxed-bulleted items.** A numbered list (1) indicates a procedure with two or more sequential steps. A boxed-bulleted (■) item indicates a procedure with only one step.
- **Square bullets.** Square-bulleted lists, such as this one, provide information but not procedural steps.
- **Command names.** Commands are usually referred to by both their menu and command name. For example, "File Open command" refers to the Open command on the File menu.

Microsoft Product Support

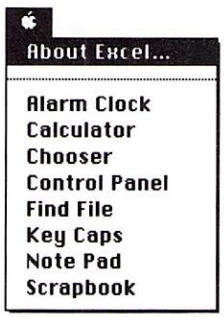
If you have a question about Microsoft Excel and you can't find the answer in any of your Microsoft Excel manuals, call our Product Support staff at the telephone number on your registration card. When you call, please have the following handy:

- The product number on your disk label
- Your *Microsoft Excel Reference* and *Microsoft Excel Functions and Macros* manuals

If appropriate, you should also be near your Macintosh and have opened the Microsoft Excel document that your question concerns.

About Excel command

Displays information about Microsoft Excel and how much memory is available. This command appears on the Apple menu.



Absolute reference

A cell can refer to the contents of another cell in one of two ways: it can make an **absolute reference** or a relative reference to another cell.

An absolute reference is like giving a street address to a friend. For example, if you give the address 1540 Maple Avenue, your friend will find the correct location. In the same way, you might use the absolute reference $C$3 to tell Microsoft Excel to look in a cell at a specific location. An absolute reference does not change if the formula containing it is copied or moved; it still refers to the same cell.

By contrast, a relative reference does not refer to one specific cell, but to a cell's location. A relative reference is like giving your friend directions by saying "go up four blocks and over two."

In the A1 reference style, absolute references have a dollar sign before the column letter and row number (for example, $B$8); relative references do not (for example, B8). In the R1C1 reference style, absolute references have no symbols surrounding row and column indicators (for example, R8C2); relative references have brackets around the row and column indicators (for example, R[8]C[2]).

For more information on absolute and relative references and on reference styles, see **References.**

Alignment

Alignment is the way text or numbers are positioned or arranged in a document. In a worksheet, alignment refers to the left, right, or center positions of text or numbers within a cell. In a chart, alignment refers to the vertical and horizontal arrangement of chart text and labels for chart objects.

This topic explains:

- Alignment in worksheets

  Aligning worksheet entries

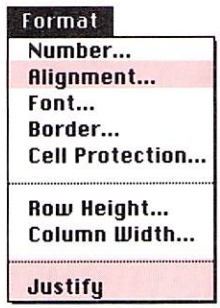
  Justifying a paragraph of text

- Text alignment in charts

  Aligning chart text

Alignment in Worksheets

You control the alignment of data in worksheets and macro sheets with these commands on the Format menu (full menus shown):



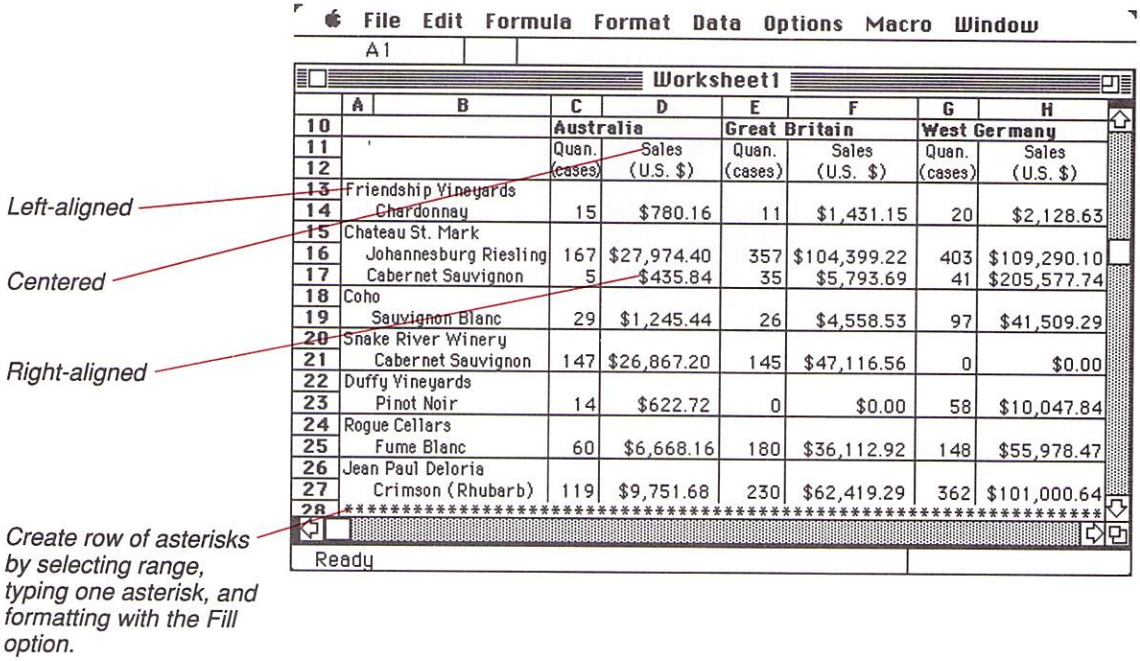
- Format Alignment controls the alignment of text or numeric entries in cells and ranges.
- Format Justify aligns paragraphs of explanatory text in a worksheet to fit the ranges that you specify.

Note All worksheet alignment options also apply to macro sheets.

Aligning Worksheet Entries

The default alignment setting is the General alignment option, controlled by the Format Alignment command. With General alignment, text is automatically aligned to the left in a cell, numbers to the right, and logical and error values (for example, #DIV/0!) in the center. Other Format Alignment settings for worksheet entries include the Left, Center, Right, and Fill options. The Fill option offers a quick way to repeat characters across an entire cell or range of cells.

The following illustration shows examples of these alignment options:



	A	B	C	D	E	F	G	H
10			Australia		Great Britain		West Germany	
11			Quan. (cases)	Sales (U.S. $)	Quan. (cases)	Sales (U.S. $)	Quan. (cases)	Sales (U.S. $)
12								
13		Friendship Vineyards						
14		Chardonnay	15	$780.16	11	$1,431.15	20	$2,128.63
15		Chateau St. Mark						
16		Johannesburg Riesling	167	$27,974.40	357	$104,399.22	403	$109,290.10
17		Cabernet Sauvignon	5	$435.84	35	$5,793.69	41	$205,577.74
18		Coho						
19		Sauvignon Blanc	29	$1,245.44	26	$4,558.53	97	$41,509.29
20		Snake River Winery						
21		Cabernet Sauvignon	147	$26,867.20	145	$47,116.56	0	$0.00
22		Duffy Vineyards						
23		Pinot Noir	14	$622.72	0	$0.00	58	$10,047.84
24		Rogue Cellars						
25		Fume Blanc	60	$6,668.16	180	$36,112.92	148	$55,978.47
26		Jean Paul Deloria						
27		Crimson (Rhubarb)	119	$9,751.68	230	$62,419.29	362	$101,000.64
28	**********	**********	**********	**********	**********	**********	**********	**********

To specify alignment or use the Fill option:

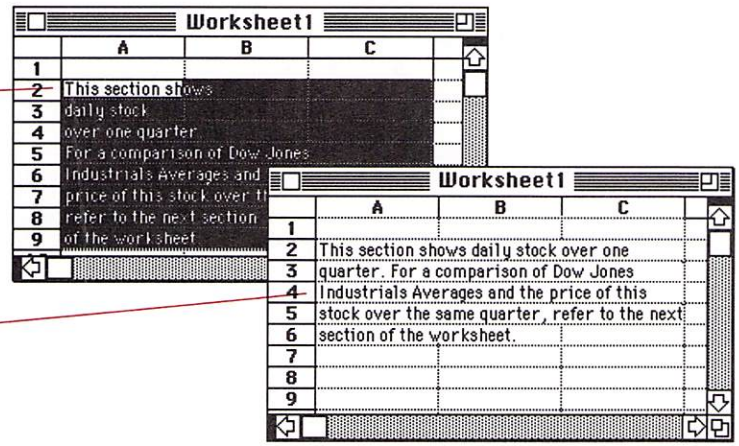
1. Select the cells you want to format.
2. Choose Format Alignment.
3. Select the option you want.
4. Click the OK button.

For more information, see the **Format Alignment command.**

Justifying a Paragraph of Text (Full Menus)

With the Format Justify command, you can neatly align paragraphs of explanatory text or comments included on a worksheet. Microsoft Excel aligns the text in a single-column or a multicolumn range that you specify. The text is aligned left, with each line measuring as close as possible to the maximum width of the column or range.

The following illustration shows how to justify a long, one-column paragraph into three columns on a worksheet:



Original, unjustified text is entered in column A. To justify the text in a three-column range, select the column containing the text and the two additional columns.

Choose the Format Justify command to evenly align the text within the three-column range.

Tip Before you justify a paragraph, you may want to adjust the column widths in the range affected. Select one cell in each column you want to adjust and use the Format Column Width command, or drag the vertical gridline to the right of the column heading in each column you want to adjust. For more information, see **Column.**

To justify a paragraph of text:

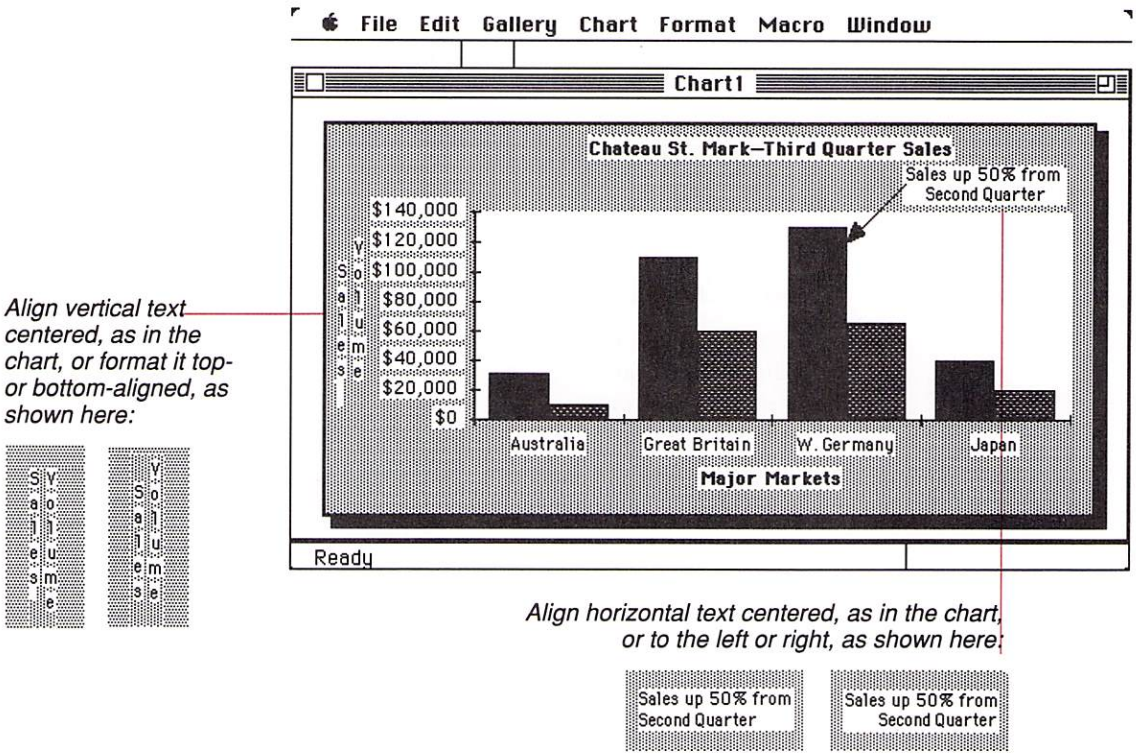
1. Select the cells containing the text you want to justify and include the entire range in which you want the justified text to appear.
2. Choose Format Justify. The Format Justify command adjusts text only within the range you specify. If the justified text does not fit within the range, Microsoft Excel displays a message asking if you want to replace the data in the cells below the selection. Clicking the OK button replaces the data in cells with justified text; clicking the Cancel button cancels the command. If the justified text is shorter than the specified range, unused cells are left blank.

Note You can use the Format Justify command only for ranges that contain text or blank cells. If you select a range that contains formulas, or numeric, logical, or error values, Microsoft Excel displays a message indicating that non-text cells are in the range.

For more information, see **Format Justify command.**

Text Alignment in Charts

To control the alignment of text in a chart (such as a category axis label), use the Format Text command. You can format both vertically- and horizontally-oriented text, as shown in the following illustration:



You can also adjust vertical text horizontally, or horizontal text vertically.

Aligning Chart Text

1. Select the chart text you want to align.
2. Choose Format Text.
3. Select the options you want.
4. Click the OK button.

For more information about formatting chart text, see **Chart text.**

Related Information

Reference

For information on	See
General overview of formatting worksheets and charts	Formatting a document
Formatting text fonts in worksheets and charts	Font
Using borders and shading in worksheets	Borders and shading

Array

In Microsoft Excel, you use **arrays** to build formulas that produce multiple results or that operate on a group of arguments arranged into rows and columns. There are two types of arrays in Microsoft Excel: **array ranges** and **array constants.** An array range is a rectangular area of cells sharing one common formula (an **array formula**). An array constant is a specially arranged group of constants that's used as an argument in a formula.

It's not necessary to know about arrays to use Microsoft Excel. Most array operations can be performed using ordinary, single-value formulas and arguments. However, in some cases you'll find that one array formula can replace a group of ordinary formulas, saving you time by simplifying entry, recalculating faster, and reducing the amount of memory used by your worksheet.

Some Microsoft Excel worksheet functions either use array constants as arguments or produce array values as results. If you want to use these functions for calculating a group of results based on a group of arguments, you'll want to learn about using arrays.

This topic explains:

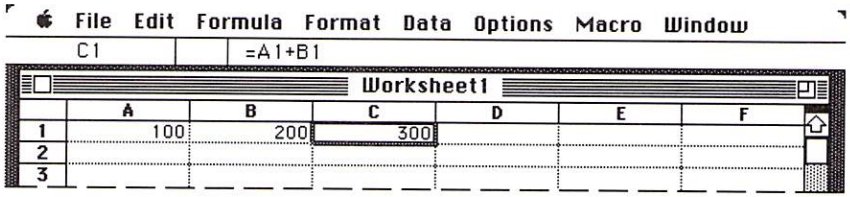
- Array ranges

  Entering an array formula
  Using arrays
  Editing an array range
  Converting an array range to constant values
  Clearing an array range

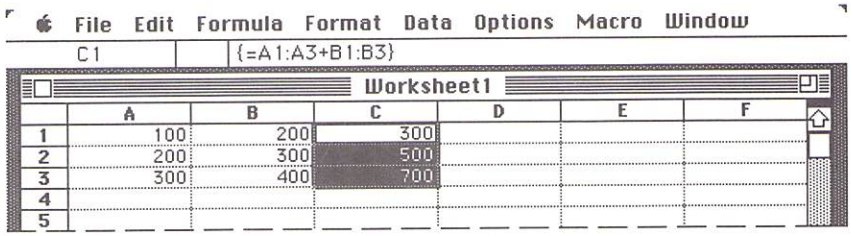
- Array constants
- Array arguments and results

Array Ranges

To understand how an array range and formula work, first consider how an ordinary, single-value formula works. A single-value formula produces a single result from one or more arguments or operands. For example, the formula =A1+B1 produces a single result — the sum of the values in cells A1 and B1:

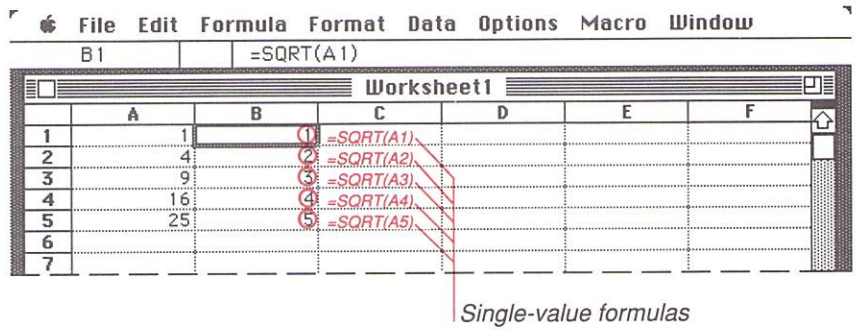


Array formulas differ from single-value formulas in that they can produce more than one result from a group of arguments or operands. For example, the array formula =A1:A3+B1:B3 produces a set of three results:



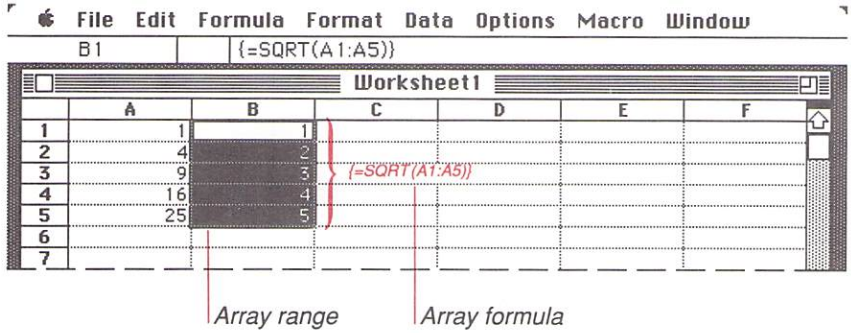
	A	B	C	D	E	F
1	100	200	300			
2	200	300	500			
3	300	400	700			
4						
5						

For some calculations, you'll find that you can replace a group of ordinary formulas with one array formula. For example, suppose you want to calculate the square root of each number entered in cell range A1:A5. You could enter five single-value formulas in five cells:

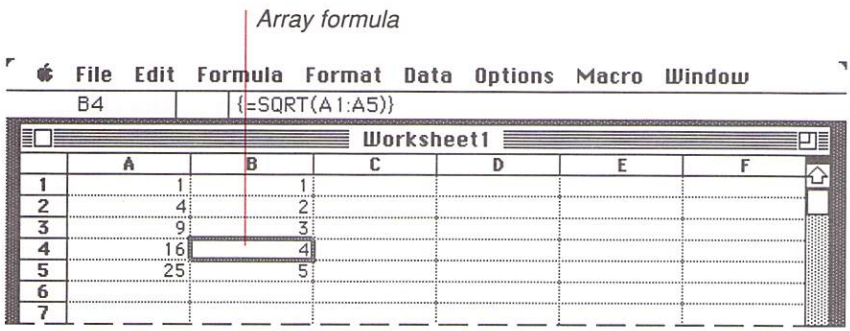


	A	B	C	D	E	F
1	1	①	=SQRT(A1)			
2	4	②	=SQRT(A2)			
3	9	③	=SQRT(A3)			
4	16	④	=SQRT(A4)			
5	25	⑤	=SQRT(A5)			
6						
7						

Or, you could enter one array formula in five cells. Unlike a single-value formula, which can occupy only a single cell, an array formula can occupy a rectangular area of cells called an array range. Because you can use just one array formula instead of several single-value formulas, using arrays saves memory.



When you select a cell in an array range, Microsoft Excel displays that array range's formula in the formula bar:



You can recognize an array formula by the braces ({}) enclosing it. Microsoft Excel automatically puts the braces around a formula when you enter it as an array; you don't type the braces yourself.

Entering an Array Formula

You enter a formula as an array by pressing Command+Enter. This tells Microsoft Excel that the formula contains an array as an argument and/or produces an array as a result.

When you enter a formula as an array, Microsoft Excel places braces ({}) around it to indicate that it's an array formula. When you activate the formula bar to edit the formula, the braces disappear.

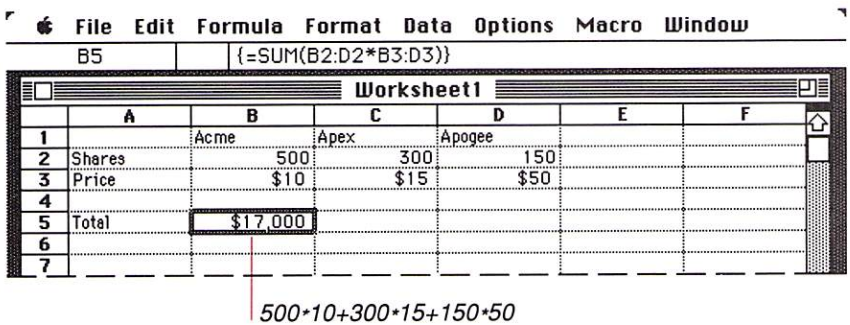
Note Don't type the braces around a formula in an attempt to enter it as an array formula. If you do, Microsoft Excel interprets the entry as text, not as an array formula.

1. Select the array range.
2. Build the formula by typing or using the mouse.
3. Press Command+Enter.

Note Make sure you hold the Command key down while you press Enter. If you only press Enter, Microsoft Excel enters the formula as an ordinary formula (not as an array formula) in the active cell (not in the selected range). If you hold only Command down, Microsoft Excel enters the formula as an ordinary formula in all the selected cells.

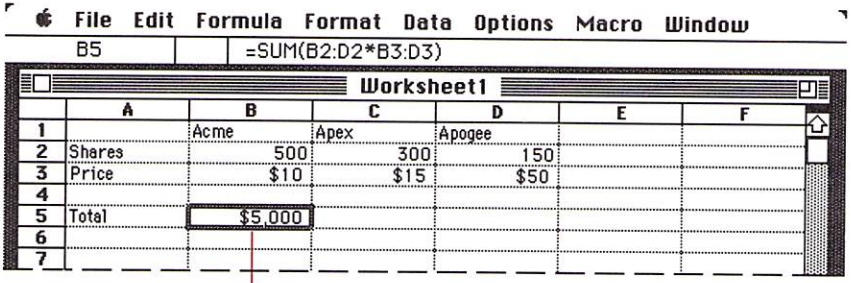
Using Arrays

In an array formula, you can give an array as an argument to a function or operator that normally operates on single values and produces a single result. For example, if you enter the formula =SUM(B2:D2*B3:D3) in a single cell by pressing Command+Enter, Microsoft Excel multiplies each value in cell range B2:D2 by the corresponding value in cell range B3:D3; then sums the resulting array of products:



Note The relative references used in an ordinary formula are always relative to the cell containing that formula. In contrast, relative references used in an array formula are always considered to be relative to the upper-left corner cell of the array range containing that formula.

Note that if you enter the formula =SUM(B2:D2*B3:D3) as an ordinary formula by pressing Enter, Microsoft Excel calculates a different result. In an ordinary formula, the multiplication operator operates on two single values, not on two arrays. Microsoft Excel uses only the value from each cell range that occupies the row or column containing the formula:

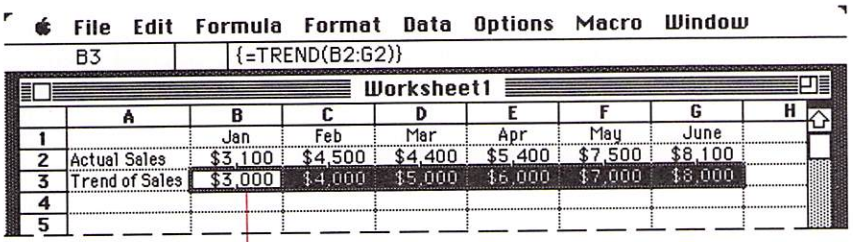


*When entered as an ordinary formula in column B, =SUM(B2:D2*B3:D3) is equivalent to =SUM(B2*B3).*

If the formula is not in a common row or column with the cell range, the formula returns the #NULL! error value.

To produce multiple results using an array formula, you enter the formula in a cell range. For example, suppose you want to compute the trend of your monthly sales figures over the last six months. That trend is described by six values — one value for each month. If your monthly sales figures are entered in cell range B2:G2, you could calculate the trend by selecting cell range B3:G3, building the formula =TREND(B2:G2), and pressing Command+Enter. (The TREND function computes the array of values that correspond to the trend of its arguments.)

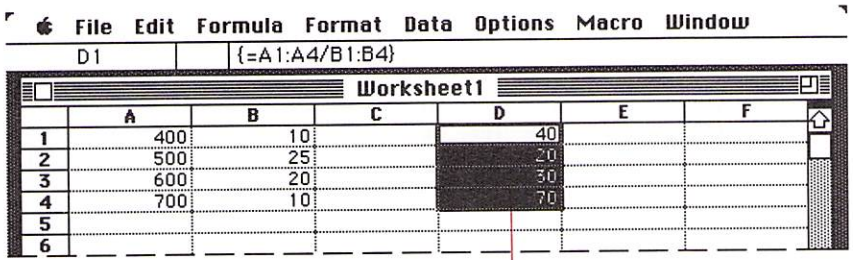
When you enter the array formula, all the cells in the selected range are filled with the formula {=TREND(B2:G2)}. And, Microsoft Excel displays the array of sales trend values in cell range B3:G3. If you fail to enter the formula as an array (for example, by pressing only the Enter key), Microsoft Excel enters the formula as an ordinary formula without braces (for example, =TREND(B2:G2)).


File Edit Formula Format Data Options Macro Window
B3
{=TREND(B2:G2)}
Worksheet1
A B C D E F G H
1 Jan Feb Mar Apr May June
2 Actual Sales $3,100 $4,500 $4,400 $5,400 $7,500 $8,100
3 Trend of Sales $3,000 $4,000 $5,000 $6,000 $7,000 $8,000
4
5

Cells B3:G3 contain the trend of the corresponding values in cells B2:G2.

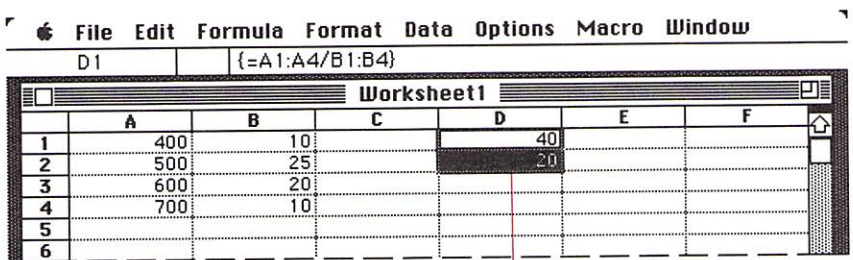
The array range in the preceding illustration (cell range B3:G3) is one row high and six columns wide. The **dimension** of that array is "1-by-6" (one row by six columns).

For most array operations, you'll want to select an array range that's the same dimension as the **result array** produced by the array formula. For example, the array formula =A1:A4/B1:B4 produces a 4-by-1 result array:



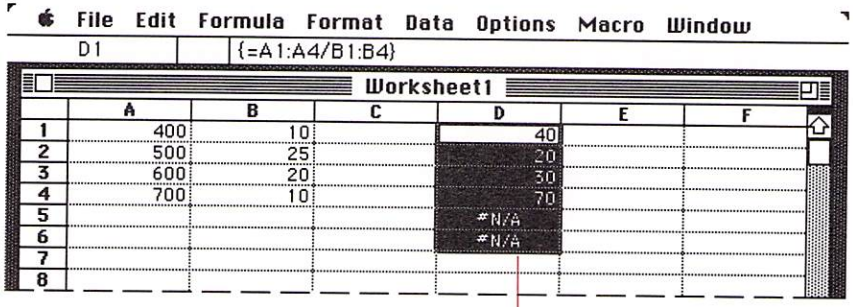
4-by-1 result array

However, if you enter =A1:A4/B1:B4 as an array formula in cell range D1:D2, Microsoft Excel displays only the first two values of the result array:



2-by-1 result array

Or, if you enter the formula in cell range D1:D6, Microsoft Excel calculates all four result array values, but displays the #N/A error value in cells D5 and D6:



6-by-1 result array

Editing an Array Range

Because an array range shares one formula, you edit an array range differently than ordinary cells. You edit an array range as if it were a single cell by selecting the array range and editing the entire range at once.

When you edit an array range, you cannot perform any operation that changes only a portion of the array range. For example, you cannot:

- Change the contents of cells that form only part of an array
- Clear or move cells that form only part of an array
- Delete cells that form only part of an array
- Insert cells within an array range

If you attempt any of these operations, Microsoft Excel displays a message that tells you the operation does not work for arrays.

To edit an array formula:

1. Select any cell in the array range.
2. Activate the formula bar.

   The array formula braces disappear when the formula bar is active.
3. Edit the formula.
4. Press Command + Enter to enter the new formula in the array range.

Tips Although you cannot change portions of an array range, you can assign a unique format to selected cells in an array range. You can also copy and paste a single cell or several cells from an array to another part of the worksheet. Microsoft Excel adjusts the relative references in the copied array formula just as it does with ordinary formulas.

For all editing operations except copying or editing the array formula, you should select the entire array range before carrying out the operation.

Converting an Array Range to Constant Values

Because of the restrictions that apply to editing an array range, you may want to convert array formula results into a range of constant values so you can edit those values.

1. Select the array range.
2. Choose Edit Copy.
3. Choose Edit Paste Special.
4. Under Paste, click Values.
5. Click the OK button.

Clearing an Array Range

1. Select the array range.
2. Choose Edit Clear.
3. Click the OK button.

Array Constants

Up to now, all the examples in this section have used references to represent arrays in formulas. In the formula =A1:A3+B1:B3, for example, A1:A3 and B1:B3 represent the two arrays containing the values in cells A1, A2, and A3 and in cells B1, B2, and B3. You can also use array constants in formulas to represent an array of values.

You specify an array constant by enclosing the values within braces ({}). Separate the values in the same row with commas, and use semicolons to separate different rows. For example, to use the following array in a formula:

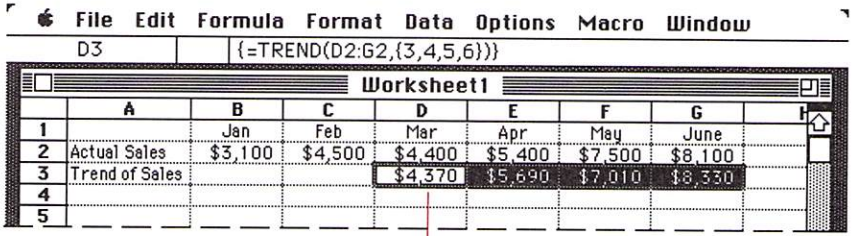
1 2 3
4 5 6

you would type:

{1,2,3;4,5,6}

The array constant {1,2,3;4,5,6} is a 2-by-3 array because it consists of two rows of three values each.

Generally, you use array constants in place of array references when you don't want to enter the array values on your worksheet. For example, in the following illustration you could compute the trend of your sales figures for March through June by entering *=TREND(D2:G2,{3,4,5,6})*. The second argument ({3,4,5,6}) tells Microsoft Excel to figure the trend for the third, fourth, fifth, and sixth cells in the array:


File Edit Formula Format Data Options Macro Window
D3
{=TREND(D2:G2,{3,4,5,6})}
Worksheet1
A B C D E F G
1 Jan Feb Mar Apr May June
2 Actual Sales $3,100 $4,500 $4,400 $5,400 $7,500 $8,100
3 Trend of Sales $4,370 $5,690 $7,010 $8,330
4
5

Cells D3:G3 contain the trend for months 3-6 (Mar through June).

Array constants can contain numbers, text, logical values, or error values. These values must be entered in the correct format for a formula. Numbers can be in integer, decimal, or scientific format, but cannot contain dollar signs, parentheses, or percent signs. Text must be enclosed in double quotation marks. You can also include different types of values in the same array constant.

Here are some examples of array constants:

Type	To get	
={*10,20,30,40*}	1-by-4 array:	10 20 30 40
={*100;200;300*}	3-by-1 array:	100 200 300
={*7,8,9;"x","y","z"*}	2-by-3 array:	7 8 9 x y z

The values in an array constant must be constants and not formulas. For example, you could not use {1+2,3+4} as an array constant. Also, you cannot enter array constants that have columns or rows of unequal length. For example, {1,2,3;4,5;6,7,8} is not a valid array constant since the middle row contains two values and the other rows contain three values.

Microsoft Excel does not allow you to list cell references or names in an array formula the same way that you list constants. For example, you could not use {A1,B1,C1} to represent the array containing the values in cells A1, B1, and C1. Instead, you would have to use the cell range reference A1:C1 or enter the values of those cells directly in the array as constants (for example, {10,20,30}).

Array Arguments and Results

When you use an array as an operand or as an argument to a function, all other operands or arguments to that function should be the same dimension as the first array. If necessary, Microsoft Excel expands constants or array constants to the dimensions required by an operation. Microsoft Excel expands only constant values, not values represented by a cell reference.

For example, in the formula =SUM({1,2,3}*4), one operand to the multiplication operator is a 1-by-3 array and the other is a single value. In evaluating this formula, Microsoft Excel automatically expands the second argument to a 1-by-3 array and evaluates the formula as =SUM({1,2,3}*{4,4,4}). The formula's result is 24, which is the sum of 1*4, 2*4, and 3*4.

When determining how to expand arguments, Microsoft Excel considers the dimensions of all the arguments used in the operation. Each argument must have the same number of rows as the argument with the greatest number of rows and the same number of columns as the argument with the greatest number of columns.

If an argument is a single value, or a 1-by-1 array, Microsoft Excel expands the argument by repeating its single value as often as necessary to produce the desired array dimension. If an argument is a one-row or one-column array, Microsoft Excel expands the argument by repeating its one row or column of values. Otherwise, if an argument is an array with multiple rows and columns, Microsoft Excel expands it to the proper dimension by filling the array with the #N/A error value.

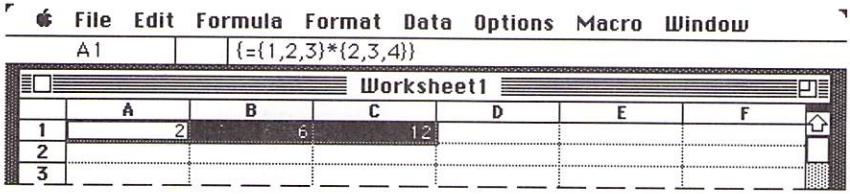
The following table shows how array arguments are expanded:

In this formula	Microsoft Excel expands the arguments to this
=1+{1,2;3,4}	{1,1;1,1}+{1,2;3,4}
={1,2,3}*{2;3}	{1,2,3;1,2,3}*{2,2,2;3,3,3}
={1,2}+{1,2,3;4,5,6}	{1,2,#N/A;1,2,#N/A}+{1,2,3;4,5,6}
={1,2;3,4;5,6}+{1,2,3;4,5,6}	{1,2,#N/A;3,4,#N/A;5,6,#N/A}+ {1,2,3;4,5,6;#N/A,#N/A,#N/A}
=MOD({5,6,7},4)	MOD({5,6,7},{4,4,4})

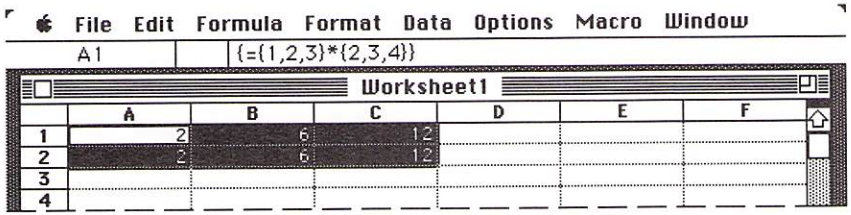
When you enter an array formula in an array range, the formula should produce an array with the same dimensions as that array range. Then, Microsoft Excel places each element of the result array in one cell of the array range.

If the result array is smaller than the array range, the result array is expanded, as described already, before its values are placed in the array range. If the result array is larger than the array range, the excess values are not shown on the worksheet.

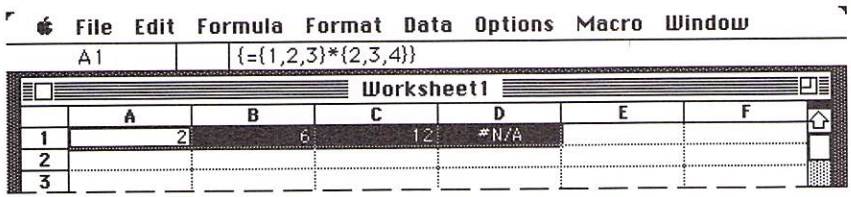
For example, if the array formula ={1,2,3}*{2,3,4} is entered into the 1-by-3 array range A1:C1, Microsoft Excel produces the 1-by-3 array {2,6,12}.



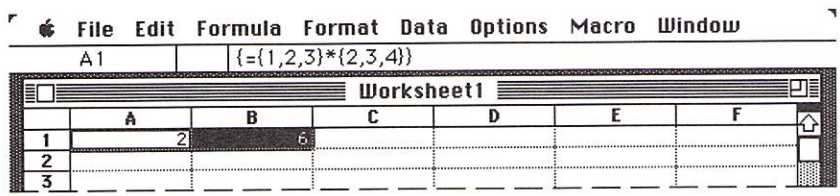
If that formula were entered into the 2-by-3 array range A1:C2, Microsoft Excel expands the result to {2,6,12;2,6,12}.



If the formula were entered into the 1-by-4 array range A1:D1, Microsoft Excel would expand the result to {2,6,12,#N/A}.



If the formula were entered into the 1-by-2 array range A1:B1, Microsoft Excel would trim the result to {2,6}.



The following table shows some examples of array calculations:

For this formula	Microsoft Excel produces this result
=\{1,2,3\}+\{4,5,6\}	\{5,7,9\}
=SQRT(\{1,4,16\})	\{1,2,4\}
=\{1,2,3\}*\{2;3\}	\{2,4,6;3,6,9\}

For this formula	Microsoft Excel produces this result
={1,2}+{1,2,3;4,5,6}	{2,4,#N/A;5,7,#N/A}
={1,2;3,4;5,6}+{1,2,3;4,5,6}	{2,4,#N/A;7,9,#N/A; #N/A,#N/A,#N/A}
=MOD({5,6,7},4)	{1,2,3}
=IF({"A";"B";"E"}={"C";"B";"A"}, TRUE,FALSE)	{FALSE;TRUE;FALSE}

Related Information

Reference

For information on	See
Building formulas	Formula Formula bar
Overview and list of built-in worksheet functions	Function
Overview of macros	Macro
Calculation and operators	Calculation Operator

Functions and Macros

Chapter 2, "Worksheet Function Directory"

Sampler

Calculating a Sales Commission

Analyzing a Loan

Auditing worksheet models

Auditing your worksheet models means checking your worksheet to make sure it's correct.

This topic explains:

- Auditing basics
- Checking names
  - Checking the definition of a name
  - Listing all defined names
  - Displaying names in the Info window
- Checking relationships between cells

Auditing Basics

Microsoft Excel provides many tools to help you audit your worksheet models:

- **Names.** You can apply names to ranges of cells on a worksheet, even after the worksheet has been created, in order to easily identify groups of cells that are similar or belong together. Names make it easier to read a worksheet and to understand the logic behind a worksheet. The "Checking Names" section of this topic discusses how to check your worksheet names. For more information on using names, see **Names.**
- **Information about circular references.** If you accidentally create a circular reference in your worksheet, Microsoft Excel can tell you where the circular reference is located. For more information, see **Circular reference.**
- **A visual overview of large documents.** You can use the File Print command, with the Preview check box turned on, to see a reduced version of a document. For more information, see **Printing a document.**
- **Specific error values.** Microsoft Excel uses seven different error values to indicate errors such as division by zero or use of unrecognized names. All error values begin with a number sign (#), so you can search for all the error values on your worksheet using the Formula Find command. You can also find cells containing error values with the Formula option of the Formula Select Special command (Full Menus). For more information, see **Formula Select Special command** and **Finding cells and data quickly.** For more information on error values, see **Error value.**

- **Cell notes.** Cell notes are useful for documenting worksheet models. You may want to use notes to explain the sources of data, to indicate the accuracy of certain numbers, and so on. For more information, see **Notes.**
- **Methods for examining the relationships between cells.** The Info window and the Formula Select Special command are powerful auditing tools. The "Checking Relationships Between Cells" section of this topic discusses how to use these tools to study how cells depend on each other.
- **Methods for finding changes in your model.** The Formula Select Special command provides ways to find cells that don't fit the pattern of the rest of your model. By selecting the Constants and Formulas options, you can find cells that contain numbers where you expected formulas, or formulas where you expected numbers. By selecting the Row Differences and Column Differences options, you can make sure that all cells in a row or column of a range contain equivalent formulas. For more information, see **Formula Select Special command** and **Finding cells and data quickly.**

Checking Names

Using names helps prevent errors in the first place, since it's easier to type or select an incorrect cell reference (for example, C28 instead of D28) than to type an incorrect name (for example, Profits instead of Losses). Once you've defined a name, it's easy to get information about it.

Checking the Definition of a Name

1. Choose Formula Define Name.
2. Select the name in the list box.
   The definition of that name is displayed in the Refers To box.

Listing All Defined Names

You can use the Formula Paste Name command to paste a list of all the names defined on a worksheet. The names are listed in a column, with definitions listed in a column to the right of the names.

Important Make sure there's sufficient room for all the names and definitions to be pasted without pasting over existing information on your worksheet. A two-column list of names and definitions is pasted on a worksheet. A four-column list is pasted on a macro sheet; the third column contains either a 1 or a 2, where 1 indicates a function macro and 2 indicates a command macro, and the fourth column lists the key combination used to run the macro.

1. Select the upper-left cell of the range in which to paste the names.
2. Choose Formula Paste Name.
3. Click the Paste List button.

Displaying Names in the Info Window (Full Menus)

The Info window lists all the named ranges that include the active cell. You can then move the active cell around the worksheet to look for specific names.

1. Choose Window Show Info to display the Info window.
2. Choose Info Names to list names in the Info window.

Checking Relationships Between Cells

You can list or select **precedents** (cells referenced by the active cell) and **dependents** (cells that reference the active cell) of cells. For information on precedents and dependents, see **Info window.** Examining the precedents and dependents of a cell is useful for:

- **Finding errors.** For example, if you find that cells B2:B200 are dependent on cells A2:A200, with the single exception of cell B129, you may have found an error.
- **Faster and easier what-if analysis.** If you'd like to see the effects of changing a value on the worksheet, knowing which cells will be affected by the change — that is, the dependent cells — will speed up checking the results.
- **Understanding someone else's model (or a model you haven't used for a while).** You may want to identify the initial values that the worksheet is based on, then find the cells directly dependent on those cells, then the cells directly dependent on those cells, and so on. This provides a quick look at the overall logic of a worksheet.

There are two ways to identify precedents and dependents:

- List them in the Info window.
- Select them with the Formula Select Special command. For information on which options to select to display precedents and dependents, see **Formula Select Special command.**

Note To use the Info window or the Formula Select Special command, you must have Full Menus displayed.

The following list summarizes when you would want to use the Info window and when you would want to use the Formula Select Special command:

If	Use
You want to find precedent/dependent cells and then modify them in some way	Formula Select Special, because it actually selects the cells.
You want to select the precedents/dependents of all the cells in the selection, not just the active cell	Formula Select Special.
You want a graphic way to see precedents/dependents, not just a list of names	Formula Select Special, because you can use Tab and Shift + Tab to move around the resulting selection and see each selected cell in context.
You want to quickly identify precedents/dependents as you move the active cell around the worksheet	Info window, because you can position the Info window on the screen with your worksheet window and watch the Info window as you move the active cell.
The precedents/dependents of a cell are far apart from each other on your document	Info window, because the list of precedents/dependents is more compact. If you use Formula Select Special, the worksheet has to scroll frequently while you look at the selected cells.
You want a print-out on the relationship of all cells in a model	Info window, because the Info window can be printed.

Tip You might also want to use the Formula Select Special command to select the precedent or dependent cells, then use the Formula Define Names command to assign a name to the selection. The Formula Define Name dialog box shows you the reference of the selection in a compact form, just like in the Info window. Once the area is named, you can easily select it with the Formula Goto command or use it in calculations.

Related Information

Reference

For information on	See
Formula Select Special	Formula Select Special command Finding cells and data quickly
Names	Names Formula Define Name command Formula Create Names command Formula Apply Names command Formula Paste Name command
The Info window	Info window

Sampler

Managing Accounts Receivable

Correcting for Instrument Drift

Borders and shading

Borders and shading are useful for highlighting key information and making a worksheet easier to read. With Microsoft Excel you can easily box off or shade cells or cell ranges on a worksheet. In addition, you can draw any combination of horizontal and vertical lines to the left, right, top, or bottom of a cell. You can create double underlines and column lines for ledgers. You can also make a blank worksheet look like a report or data entry form.

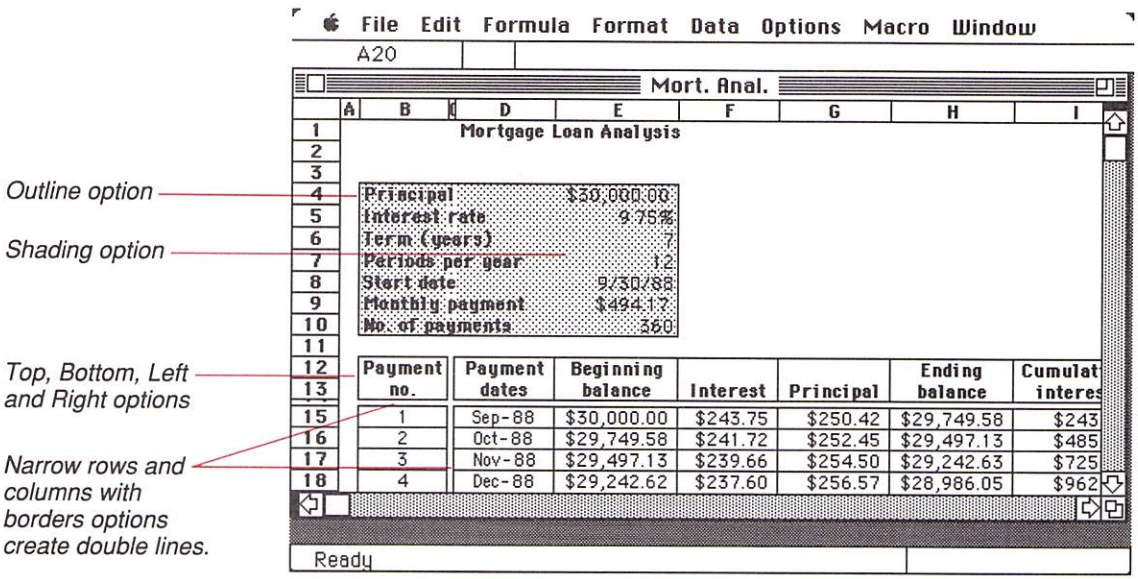
This topic explains:

- Adding borders or shading
- Deleting borders or shading
- Suggestions for formatting

Note All worksheet border and shading options also apply to macro sheets.

Adding Borders or Shading

The Format Border command controls border and shading formats. The following illustration shows how you can use Format Border settings to enhance a worksheet:


Outline option
Shading option
Top, Bottom, Left and Right options
Narrow rows and columns with borders options create double lines.
File Edit Formula Format Data Options Macro Window
A20
Mort. Anal.
Mortgage Loan Analysis
Principal $30,000.00
Interest rate 9.75%
Term (years) 7
Periods per year 12
Start date 9/30/88
Monthly payment $494.17
No. of payments 360
Payment no. | Payment dates | Beginning balance | Interest | Principal | Ending balance | Cumulat interes
1 | Sep-88 | $30,000.00 | $243.75 | $250.42 | $29,749.58 | $243
2 | Oct-88 | $29,749.58 | $241.72 | $252.45 | $29,497.13 | $485
3 | Nov-88 | $29,497.13 | $239.66 | $254.50 | $29,242.63 | $725
4 | Dec-88 | $29,242.62 | $237.60 | $256.57 | $28,986.05 | $962
Ready

Border and shading formats apply to both the onscreen display and the printed worksheet. The quality of shading depends on screen and printer resolution.

To add borders or shading:

1. Select the cell or cells you want to format.
2. Choose Format Border.
3. Turn on the check boxes for the border or shading options you want.
4. Click the OK button.

For more information, see **Format Border command.** For information on column width and row height, see **Column** and **Row.**

Deleting Borders or Shading

1. Select the area you want to reformat.
2. Choose Format Border.
3. Turn off the check box for any border or shading option you want to delete.
4. Click the OK button.

Suggestions for Formatting

Use Format Border options in worksheets to add fine touches such as double underlines and thin double column lines, as shown in the illustration earlier in this topic:

- For double underlines, make a narrow row height (drag the bottom horizontal gridline in the row heading for the row you want to reduce, or use the Format Row Height command). Select the cells where you want to place the underlines. Choose Format Border and turn on the Top and Bottom check boxes.
- For double column lines, make a narrow column width (drag the left vertical gridline in the column heading to the right for the column you want to narrow, or use the Format Column Width command). Select the cells where you want the double lines. Choose Format Border and turn on the Left and Right check boxes.

For instructions on how to automate this procedure as a simple macro, see **Macro.**

Hiding the gridlines on a worksheet makes formats such as borders, double underlining, and shading stand out:

- To hide gridlines when you display a worksheet, choose Options Display and turn off the Gridlines check box.
- To hide gridlines when you print a worksheet, choose File Page Setup and turn off the Print Gridlines check box.

Related Information

Reference

For information on	See
Using borders with chart text	Chart text
Text alignment in worksheets and charts	Alignment
Using fonts in worksheets and charts	Font
General overview of formatting worksheets and charts (including print and display options)	Formatting a document

Calculation

Calculation is the process of computing formulas and displaying the results as values in the cells containing the formulas.

This topic explains:

- Calculation in Microsoft Excel
- Changing to manual or automatic calculation
- Starting manual calculation from a worksheet window
- Starting manual calculation from a chart window
- Calculating with the Precision As Displayed option
- Other adjustments to calculation

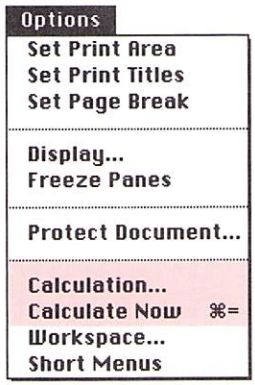
Calculation in Microsoft Excel

To speed up worksheet calculation, Microsoft Excel calculates cells selectively. When you change a value, Microsoft Excel updates only those cells that are directly affected by the change, thus avoiding unnecessary calculations.

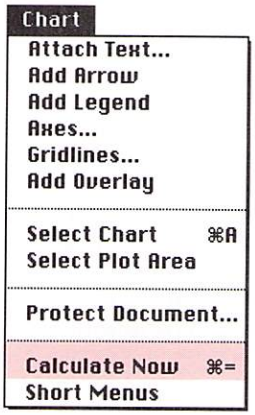
Microsoft Excel calculates on the basis of the underlying stored values in cells, not their display formats. This means that you can change the appearance of a cell through the Format Number command without affecting its formula or stored value. Microsoft Excel calculates on the basis of displayed or formatted values only when you specify "Precision As Displayed." For more information, see "Calculating with the Precision As Displayed Option," later in this topic.

While Microsoft Excel calculates, you can choose commands or perform actions such as entering numbers or formulas. Microsoft Excel temporarily interrupts calculation to carry out the other commands or actions and then resumes calculation. When Microsoft Excel calculates your worksheet, it displays the number of cells being calculated to the left of the formula bar.

When you start Microsoft Excel for the first time, calculation is automatic. Immediately after you make changes in a document, Microsoft Excel calculates any formulas affected. You can set calculation so that it occurs only when you want it to. You control calculation with the following commands (full menus shown):



- Use Options Calculation to set automatic or manual calculation for the entire workspace or to specify Precision As Displayed.
- Use Options Calculate Now to start calculating all open worksheets (when manual calculation is set) or to replace a formula in the formula bar with its calculated value. The shifted version of this command, Options Calculate Document, calculates only the active worksheet.



- Use the Chart Calculate Now command to start manual calculation while a chart window is active.

The Options Calculation command also controls other calculation-related adjustments. For more information, see "Other Adjustments to Calculation," later in this topic. For more information on each command, see the topic of the same name.

Changing to Manual or Automatic Calculation

Even though Microsoft Excel saves time by calculating only formulas affected by changes, you can further speed up calculation when entering or editing many formulas by changing from the automatic to the manual calculation setting.

Switching to manual calculation also saves time if you are working with charts because, otherwise, Microsoft Excel redraws any open charts linked to the active worksheet when you make changes on the worksheet. Note that changing to manual or automatic calculation affects the way all open worksheets are calculated.

To change to manual or automatic calculation:

1. Choose Options Calculation.
2. For manual calculation, click Manual.
   For automatic calculation, click Automatic.
3. Click the OK button.

Note Data tables may slow down calculation. If you do not want to calculate your data tables every time you enter a new value on the worksheet, you can speed up automatic calculation by clicking Automatic Except Tables in the dialog box for the Options Calculation command.

Starting Manual Calculation from a Worksheet Window

When you change to manual calculation, you need to tell Microsoft Excel every time you want to calculate your documents. You can specify that all open worksheets or only the active worksheet be calculated. To calculate the formulas on all open worksheets and update all open chart documents, you use the Options Calculate Now command. To calculate the active worksheet and update only the open charts linked to it, you use the shifted command, Options Calculate Document. In either case, Microsoft Excel does not resume automatic calculation until you tell it to do so. For more information, see "Changing to Manual or Automatic Calculation," earlier in this topic.

Important If you choose the Options Calculate Now command while the formula bar is active, the command performs a different function: it replaces the formula or the selected part of the formula in the active cell with the calculated result of the formula or partial formula. You can use this option if you want to "freeze" a formula value, but note that this also erases the formula. For more information on replacing a formula with its calculated value, see **Formula.**

To calculate all open worksheets	To calculate only the active worksheet
▣ Choose Options Calculate Now.	1 Hold down Shift as you select the Options menu. 2 Choose Options Calculate Document.

Starting Manual Calculation from a Chart Window

You can start manual calculation from an active chart window without switching back to a worksheet window.

To calculate all open worksheets and update charts:

▣ Choose Chart Calculate Now.

Calculating with the Precision As Displayed Option

You can use built-in or custom formats from the Format Number command to change the appearance of a cell without affecting its formula or underlying stored value. Unless you specify otherwise, Microsoft Excel calculates formulas based on their stored values, rather than the displayed values. Microsoft Excel calculates a worksheet or macro sheet on the basis of displayed values only when you specify Precision As Displayed for that sheet.

Important Calculating with Precision As Displayed permanently changes the stored values to the values as displayed in the cells.

To calculate the active sheet with the Precision As Displayed option:

1. Choose Options Calculation.
2. Turn on the Precision As Displayed check box.
3. Click the OK button.
   Microsoft Excel displays a message asking for confirmation.
4. Click the OK button.

Other Adjustments to Calculation

You can also control the following calculation-related adjustments with the Options Calculation command:

- To use iteration, turn on the Iteration check box and specify the conditions you want in the Maximum Iterations and Maximum Change boxes. This option affects all open worksheets. For more information, see **Iteration.**
- To adjust dates in files you plan to use in Microsoft Excel, turn off the 1904 Date System check box. This option affects the active sheet only. For more information, see **Date.**

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Using built-in and custom number formats	Number
Working in the formula bar	Formula bar

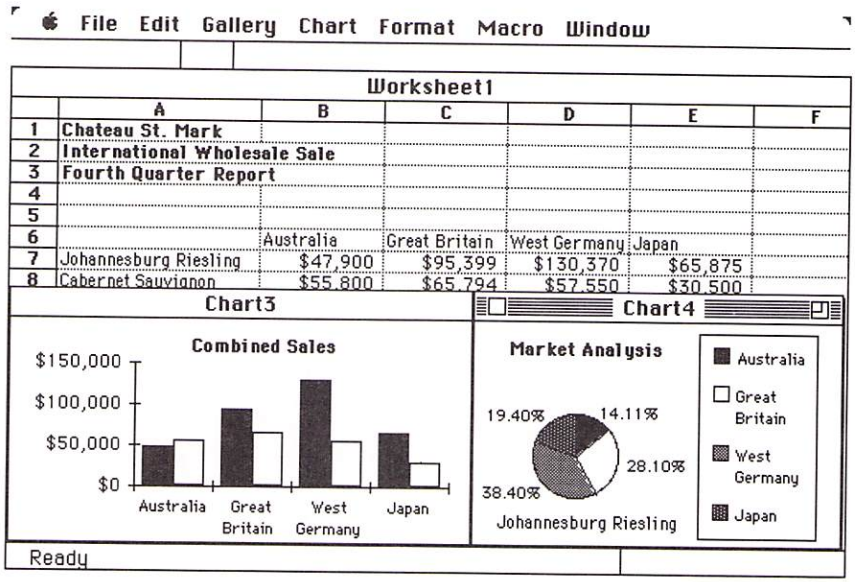
Sampler

Analyzing a Loan

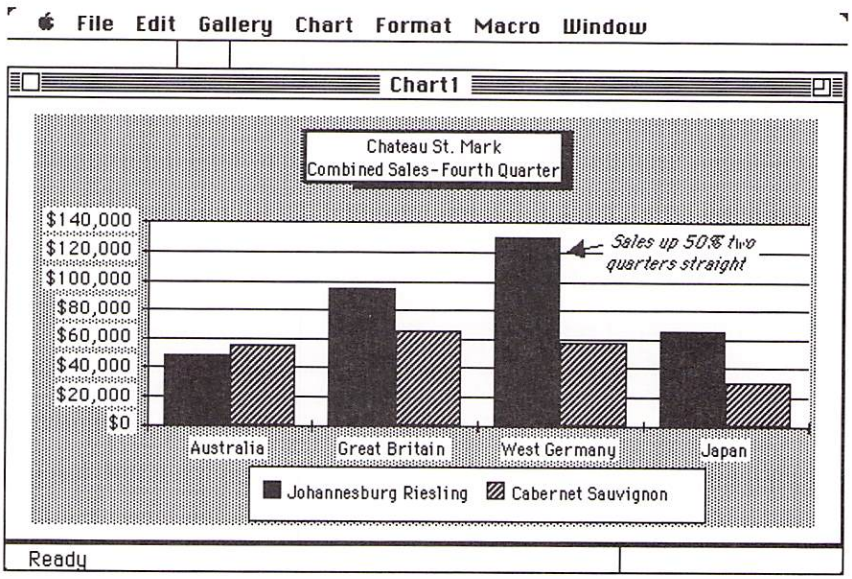
Chart

A **chart** is a graphic representation of data from a worksheet. Microsoft Excel has seven types of charts to choose from: area, bar, column, line, pie, scatter, and combination. The seven chart types are available in 44 built-in formats, each of which you can also customize.

Microsoft Excel provides a complete charting package for such uses as instantly seeing your worksheet data graphically displayed and dynamically linking worksheets and charts. These powerful uses of charts are shown in the following illustrations.



Built-in formats and customizing features help you create professional-looking graphics for slides or printed reports.



This topic explains:

- Making charts

  Creating a new chart
  Using the chart window
  Moving and selecting in the chart window

- Using the built-in chart formats

  Types of charts in the gallery
  Strategies for using charts
  Changing chart type or formats with the Gallery commands

- Techniques for quick analysis
- Customizing a chart

  Overview of chart customizing features
  Changing chart type or formats after you customize
  Using the preferred chart format

- Saving and printing a chart

  Saving a new chart
  Printing a chart

Making Charts

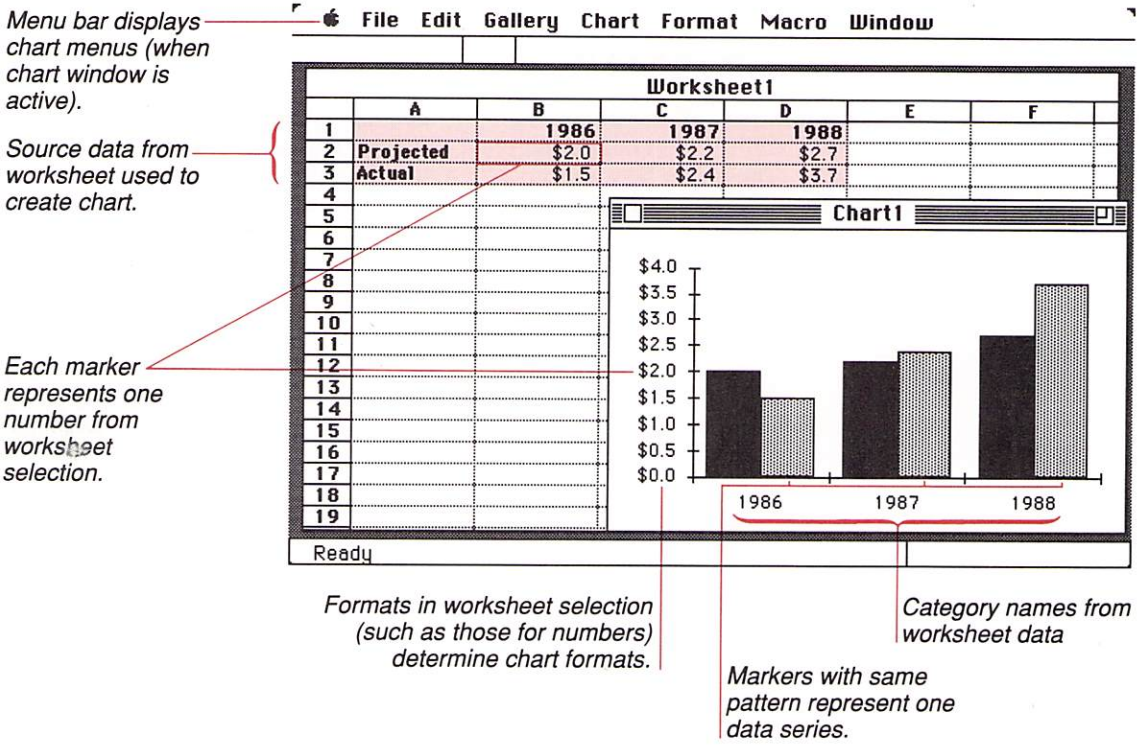
This section explains how to create a new chart and work with the Chart window.

Creating a New Chart

1. Select the worksheet cells that contain the data you want to plot.
   Be sure to select the row and column names for the data you want to plot. Do not select empty cells outside the rows and columns of your data. You can create a chart from one range of cells or from a multiple selection on the same worksheet.
2. Choose File New.
3. Click Chart.
4. Click the OK button.

Microsoft Excel takes care of setting up the chart. It looks at the shape of the range you selected and also at the kinds of entries. Then it plots the data as a column chart, the default for a new chart. Microsoft Excel gives a default name (such as Chart1, Chart2, or Chart3) to each chart created during a session.

The following illustration shows a new chart and the worksheet data used to create the chart:



When you create a new chart, Microsoft Excel uses defaults for defining data series and plotting data. For information on how Microsoft Excel defines data series, see **Chart data series.**

You can override Microsoft Excel defaults for plotting data by using one of the following procedures to create a chart:

- You can use a multiple selection to control plotting. For more information, see **Chart data series.**

- You can copy data series or formats from worksheet data and then paste them into a chart. For more information, see **Chart data series.**

Note You can also create a chart that is not linked to a worksheet by building series formulas — the formulas Microsoft Excel uses to plot charts — from "scratch." For information on building a series formula, see **Series formula.**

Using the Chart Window

You display and work on charts in the chart window. You can move, size, shrink, and enlarge the chart window as you would any other window. The sizing box appears when you drag the lower-right corner of the window. You can also open multiple chart and worksheet windows on the screen at the same time and use the Window Arrange All command to see all your windows simultaneously.

The following illustration shows the parts of a chart window:

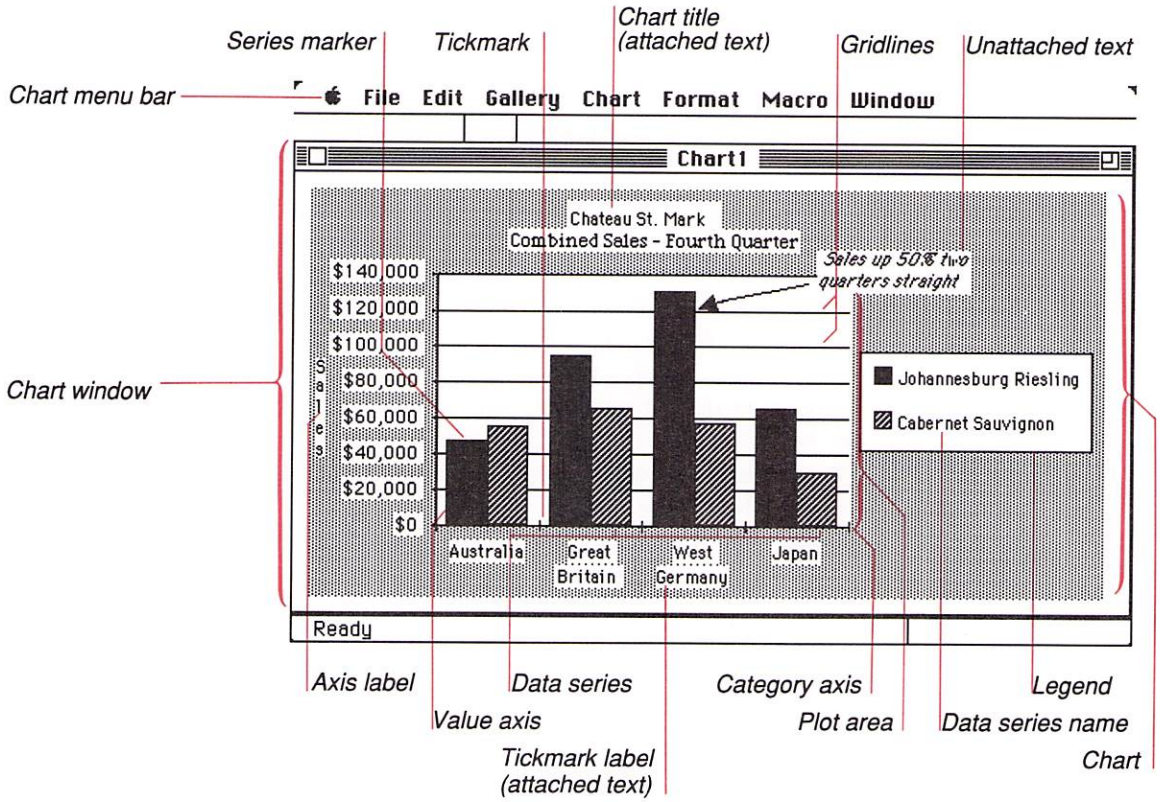


Chart — the entire area inside the chart window, including all elements of the chart, such as text, axes, or markers.

Chart menu bar — the bar that displays the names of the menus for charts when a chart window is active.

Data series — a group of related data points (numeric values within a category). A chart can have one or more data series.

Series marker — a bar (column and bar charts), dot, or small symbol (line and scatter charts) that plots a single data point (one value in a category) from a worksheet. Related markers in a chart make up a data series. Markers for a data series are usually distinguished by the same pattern, color, or symbol. In a chart with a single data series, markers may vary in pattern, color, or symbol.

Series formula — a formula consisting of the data Microsoft Excel uses to plot a data series in a chart. The formula includes a reference to the cell that contains the data series name, constants or references to worksheet cells used for categories and values, and the plotting order of the data.

Axis — a line that serves as a major reference for plotting data in a chart. In Microsoft Excel, **category axis** usually refers to the horizontal axis (x-axis), while **value axis** refers to the vertical axis (y-axis). Bar charts reverse this layout, with the value axis as the horizontal axis and the category axis as the vertical axis. A pie chart has no axes. Area, bar, column, line, and scatter charts each have two axes. A combination chart can have up to four axes.

Tickmark — a small line on an axis that marks off a category or scale. A tickmark label is attached text that identifies a tickmark.

Plot area — the area bounded by the axes, in which Microsoft Excel plots your data. It includes the axes and all markers that represent data points.

Gridlines — optional lines that extend from the tickmarks across the plot area.

Chart text — text that describes data or objects in a chart. **Attached text** is any label linked to a chart object such as an axis or a data point. Such text moves with the object if it is repositioned. **Unattached text** is not linked to a chart object and can be moved anywhere in the chart.

Legend — a key that identifies the patterns, colors, or symbols associated with the markers of a data series.

Data series name — a label on a chart legend that identifies the specific pattern, color, or symbol used in the markers of a data series.

Moving and Selecting in the Chart Window

You can move object-by-object or between classes of objects. Microsoft Excel groups chart objects into the following classes:

- Chart
- Plot area
- Legend
- Axes

- Chart text
- Chart arrows
- Gridlines
- Data series
- Drop lines
- Hi-lo lines

To move and select with the mouse in the chart window:

1. Point to the chart object.
2. Click the mouse button.

To move and select with the keyboard, use the Direction keys. Use the Up and Down Arrow keys to move among classes of objects, and the Left and Right Arrow keys to move among objects within each class, as follows:

Go to first item in next class

Go to last item in previous class

Go to next item in same class

Go to previous item in same class

Note To select the entire chart or the plot area, choose the Chart Select Chart command or the Chart Select Plot Area command.

When selected, a chart object is marked with white squares or black squares, depending on what type of object it is. These black or white selection squares tell you that the next command or action will affect the selected item.

Chart objects and text marked with black selection squares can be formatted with commands, and moved or sized directly with the mouse or keyboard.

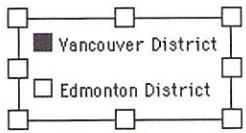


Chart objects and text marked with white selection squares cannot be moved or sized directly. Some items, such as the legend or axes labels, can be formatted or realigned with commands.

When chart text is selected, it appears in the formula bar so you can edit it. When series markers are selected, the series formula for the data series is displayed in the formula bar. You can edit this formula to control how data is plotted. For information on editing a series formula, see **Series formula.**

Using the Built-in Chart Formats

The Gallery menu commands enable you to instantly reformat a new chart with any of 44 built-in chart formats. You can also customize a chart by starting with a built-in format that is close to what you want, and then adding your own formatting changes. This section discusses the types of charts in the gallery, their best uses, effective strategies for using charts, and how to use the gallery formats.

Types of Charts in the Gallery

Microsoft Excel has six basic types of charts: area, bar, column, line, pie, and scatter charts. You can also create charts that are combinations of these types. The following table summarizes the chart types and the most appropriate uses of each.

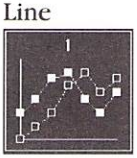
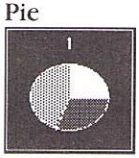
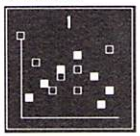
Chart type	Uses
Area	Shows the relative importance of values over a period of time; similar to line chart, but emphasizes amount of change (magnitude of values) rather than rate of change.
Bar	Shows individual figures at a specific time or draws comparisons among items but not to a whole; similar to column chart but vertical orientation places less emphasis on time flow.
Column	Shows variation over a period of time or draws comparisons among items but not to a whole; horizontal orientation suggests time flow more than bar chart.
Line 	Shows trends or changes in data over a period of time; similar to area chart, but emphasizes time flow and rate of change, rather than amount of change.
Pie 	Shows the relationship or proportions of parts to the whole (always contains just one data series); good for highlighting a significant element.

Chart type	Uses
Scatter 	Shows the relationship or degree of relationship between the numeric values in different groups of data; useful for finding patterns or trends and for determining whether variables are dependent upon or affect one another.
Combination	(Full menus only) Shows related data that is measured in different units (up to four axes can be used in a combination chart); combines "data" to create a different perspective.

Each chart type is a command on the Gallery menu. When you choose one of these commands, Microsoft Excel presents a gallery that shows the built-in formats for that chart type.

For a quick tour of the chart galleries, see **Gallery Area command, Gallery Bar command, Gallery Column command, Gallery Line command, Gallery Pie command, Gallery Scatter command,** and **Gallery Combination command.** Each topic also points out special features of the formats.

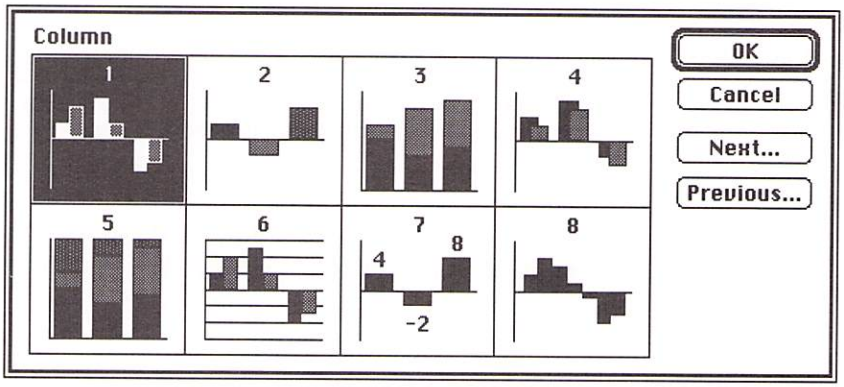
Strategies for Using Charts

You'll find the Gallery commands useful for the following strategies:

- Experimenting with different chart types and formats to find the one best suited to your needs.
- Setting up a base chart with a built-in format that you can then tailor to your needs. Because gallery settings may override your custom formats, use gallery formats before you add your own formats to the chart.
- Analyzing data quickly by viewing it in several chart formats.

Most gallery choices, such as stacked columns, gridlines, and data point labels, are formatting shortcuts. They automatically incorporate chart elements you could add manually, such as gridlines, overlay charts, or data point labels.

For example, the column chart gallery looks like this:



Changing Chart Type or Format with the Gallery Commands

1. Activate the chart window.
2. Select the Gallery menu.
   The checkmark on the menu indicates the type of chart in the active chart window.
3. Choose the command for the chart type you want.
   A dialog box displays a gallery of different formats for that chart type.
4. Click the format you want.
5. Click the OK button.

Note If you change a chart with multiple data series to a pie chart, Microsoft Excel plots only the first data series. For more information, see **Gallery Pie command.**

Scatter charts have different requirements for plotting data than other types of charts. For more information on scatter charts, see **Scatter chart.**

Techniques for Quick Analysis

Charting the same worksheet data in different ways may reveal new relationships or hidden trends in the data. Try this:

1. Repeat the procedures under "Creating a New Chart," earlier in this topic, several times to create several column charts of the same data.
2. Activate one of the chart windows.
3. Select the Gallery menu and choose a command for a chart type other than Column. This replots the chart as a new chart type.
4. Repeat steps 2 and 3 with the other chart types to see how the data looks plotted in other ways.
5. Move and size the chart windows so you can view all of them on the screen. Change a value on the worksheet; all charts are instantly updated. You can also use this technique to discover which chart type works best for your purpose.

Customizing a Chart

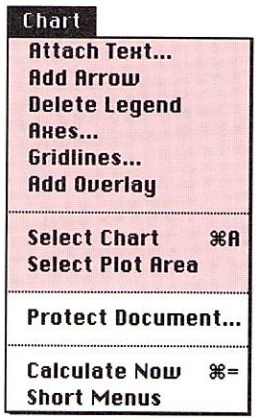
You can customize a chart by:

- Reformatting any of the chart objects that Microsoft Excel automatically includes in a new chart — such as series markers or axes
- Adding and formatting other chart objects — such as a legend, chart title and subtitle, explanatory text, or arrows for emphasis
- Controlling how data is plotted
- Creating overlay charts

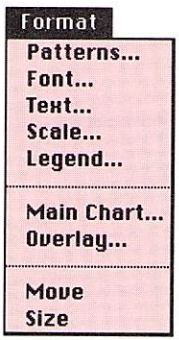
This section provides an overview of chart customizing features and explains how to change chart formats after customizing.

Overview of Chart Customizing Features

You can use Microsoft Excel customizing features to enhance your charts for presentations and printed reports. Most of the commands for customizing a chart are on the Chart menu and the Format menu (full menus shown):

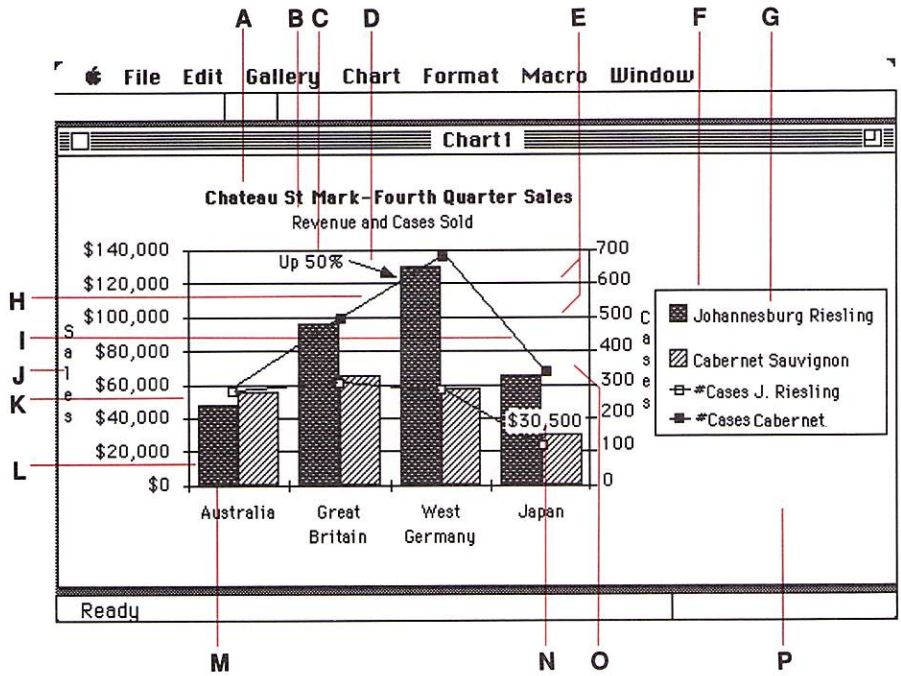


Use the Chart menu commands to add chart objects or text, or to select the entire chart or plot area.



Use the Format menu commands to format the chart, chart objects, and chart text and to move or size chart objects and text with the keyboard.

The following illustration demonstrates the available customizing features. For complete procedural information about a feature you want to use, refer to the topics listed in the table. For a brief description of each Chart and Format menu command, see the topic listed alphabetically under the command name.



For information on		See
A	Chart title	Chart text
B	Chart subtitle	Chart text
C	Unattached text	Chart text
D	Arrow	Chart arrow
E	Gridlines	Chart axis
F	Legend	Chart legend
G	Data series name (attached text)	Series formula

For information on		See
H	Line chart options (drop lines, hi-lo lines)	Gallery Line command Format Main Chart command Format Overlay command
I	Overlay chart (for combination chart)	Overlay chart
J	Axis title	Chart text
K	Axis	Chart axis
L	Data series marker	Chart data series
M	Data series (adding; controlling how data series are plotted)	Chart data series
N	Data point label (attached text)	Chart text
O	Plot area	Chart plot area
P	Chart area	Chart area

An additional topic, **Formatting a document,** contains brief summaries of chart customizing procedures. That topic is most useful if you are familiar with the more detailed information in the topics listed in the preceding table.

Changing Chart Type or Format After You Customize

If you want to change the chart type after you customize a chart, use the Format Main Chart command. Your custom formats are preserved in the new chart type, if appropriate.

1. Choose Format Main Chart.
2. Under Type, click the chart type you want.
3. Click the OK button.

If you want to change the formats of a customized chart, the Format Main Chart dialog box offers many of the same options as the Gallery formats (for example, stacked formats, hi-lo lines, or drop lines). Your customized changes appear with the new formats, if appropriate.

To change formats after you customize:

1. Choose Format Main Chart.
   The dialog box displays format options appropriate to the chart type. All other options are grayed.
2. Click the format options you want.
3. Click the OK button.

Note Using a Gallery command on a customized chart removes many of the custom formats.

For more information, see **Format Main Chart command.**

Using the Preferred Chart Format (Full Menus)

The preferred chart format is the default chart format. Initially, the preferred format is the first option in the Gallery Column command dialog box. Every new chart you create first appears as this type of column chart. After altering a chart's appearance, you can use the preferred format to return the chart to its default format.

To change a chart to the preferred format:

- Choose Gallery Preferred.

You can change the default so that Microsoft Excel creates new charts in whatever format you want — one of the built-in Gallery formats or a custom format you've created. If you prefer a custom format, first create your chart format by modifying a Gallery chart option.

To change the preferred chart format:

1. Activate the chart window.
2. Make sure the chart is in the format you want for the default.
3. Choose Gallery Set Preferred.

Microsoft Excel saves all formatting details of the active chart as the preferred format. Any new chart you create during the work session is formatted accordingly. You can also apply the format to existing charts during the work session.

For more information, see **Gallery Preferred command** and **Gallery Set Preferred command.**

Note You can save the settings of the preferred format by saving the workspace with the File Save Workspace command (full menus). When you restart Microsoft Excel and open the workspace file, Microsoft Excel resets the preferred format to what it was when the workspace file was saved. For more information, see **File Save Workspace command.**

Saving and Printing a Chart

You save and print each chart as a separate document.

Saving a New Chart

1. With the chart window active, choose File Save As.
   The dialog box displays a default document name in the text box.
2. Type a document name for the chart in the text box.
   Your document name automatically replaces the default name when you start typing.
   If you want to save the chart in a different folder than the active folder, select the folder before naming the chart.
3. Click the OK button.
   A chart file is represented by a column-chart icon.

Once you've named the chart file, you can use the File Save command whenever you want to save it again. To rename the file, use the File Save As command.

For more information, see **Saving and closing a document, File Save command,** and **File Save As command.**

Printing a Chart

Before you print:

- If you want to use a different printer, you must use the Chooser command on the Apple menu to select the printer you want to use. For more information, see **Printing a document.**
- Preview the chart. The Page Preview option in the File Print dialog box shows you what the printed chart will look like. You can view the chart at different scales, examine any detail on the previewed page, and make any necessary page layout adjustments with the File Page Setup command. For more information, see **File Page Setup command.**

To print a chart:

1. With the chart window active, choose File Print. Make sure Page Preview is turned off.
2. Click the OK button.

For more information, see **Printing a document.**

Related Information

Reference

For information on	See
Chart default settings	Default settings
Copying chart contents and formats from one chart to another	Copying data and formats
Copying a chart to another application	Edit Copy Picture command
Links between charts and worksheets	Series formula
Controlling windows	Windows
Choosing commands and dialog box options	Command, menu, and dialog box
Working with chart axes	Chart axis
Getting help with chart commands and procedures	Help

You can find information about Microsoft Excel basics in the other core topics: **Command, menu, and dialog box; Database; Help; Windows;** and **Worksheet.**

Sampler

Analyzing the Break-even Point

Presenting Data Graphically

Changing Coordinate Systems

Chart Add Arrow command

Adds an arrow to the upper-left corner of the chart. You can add as many arrows as you want. You can move the arrow or change its size by dragging it with the mouse, or format the arrow with the Format Patterns command.

When you select an arrow, the command changes to Chart Delete Arrow.

For more information on chart arrows, see **Chart arrow.**

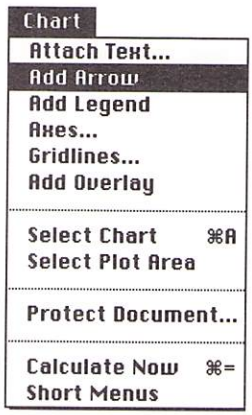


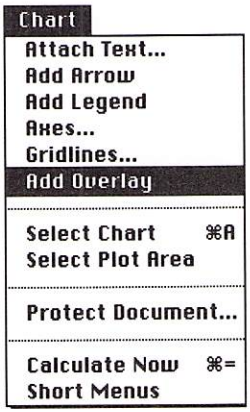
Chart Add Legend command

Adds a legend to the active chart. When you add a legend, the plot area becomes smaller to accommodate the legend. You can format the legend with the Format Patterns, Format Font, and Format Legend commands.

When an existing legend is selected, the command changes to Chart Delete Legend; you can use this command to remove the legend. If you delete a legend and then later choose Chart Add Legend for the same chart, the new legend will have the same format as the one you deleted.

Chart Add Overlay command

(Full Menus)



Creates an overlay chart and adds it to the active chart. If the active chart already has an overlay chart on it, this command changes to Chart Delete Overlay.

When you add an overlay chart, Microsoft Excel divides the data series evenly between the main chart and the overlay chart. When there is an odd number of data series, the main chart has one more than the overlay chart.

For example, if your chart has four data series, the first two are plotted in the main chart and the last two go into the overlay chart. If your chart has five data series, the first three go into the main chart, and the other two go into the overlay chart.

The overlay chart is always initially plotted as a line chart. You can change the overlay chart type with the Format Overlay command.

For information on overlay charts, see **Overlay chart.** For information on charts, see **Chart.**

Chart area

The **chart area** is the entire background area of the chart. You can change the pattern or color of the chart area and format the border with several pattern, weight, and style options, including a shadow border effect.

Formatting the Chart Area

1. Choose Chart Select Chart to select the chart.
2. Choose Format Patterns.
3. Click the options you want.
4. Click the OK button.

For more information, see **Chart Select Chart command** and **Format Patterns command.**

Related Information

Reference

For information on	See
Chart basics	Chart
Plot area	Chart plot area
Gridlines	Chart axis

Chart arrow

You can add **arrows** to emphasize key elements or data in a chart, and to connect data with explanatory text.

This topic explains:

- Adding an arrow
- Moving or sizing an arrow
- Formatting an arrow
- Deleting an arrow

Adding an Arrow

You can add any number of arrows to one chart. When you add an arrow, Microsoft Excel places a small black square at each end of the arrow to indicate that the arrow is selected. These selection squares also appear anytime you select the arrow to move, size, format, or delete it.

■ With the chart window active, choose Chart Add Arrow.

Microsoft Excel inserts an arrow in the chart. You can move or size the arrow to fit your needs.

Moving or Sizing an Arrow

1. To move the arrow, drag the arrow shaft.
   To size the arrow, drag the black selection squares.
2. Release the mouse button when the arrow is positioned or sized as you want it.

Formatting an Arrow

You can change the style, line width, or head width of an arrow. Follow these steps:

1. Select the arrow.
2. Choose Format Patterns.
3. Click the formatting options you want.
4. Click the OK button.

Deleting an Arrow

Whenever you select an arrow, the Chart Add Arrow command changes to Chart Delete Arrow on the menu.

1. Select the arrow.
2. Choose Chart Delete Arrow.

For more information, see **Chart Add Arrow command.** For information on basic techniques for working with chart objects, see **Chart.**

Related Information

Reference

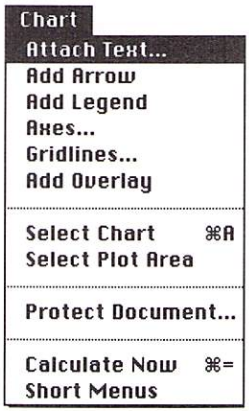
For information on	See
Chart basics	Chart
Unattached text	Chart text

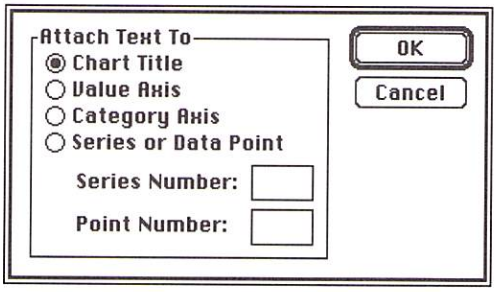
Sampler

Analyzing the Break-even Point

Chart Attach Text command

Attaches text to certain parts of a chart, such as axes, the plot area, and data points. The text identifies the part to which it is attached. After you attach the text, you can edit the text in the formula bar.





Click the option that identifies the part of the chart you want to attach text to, and then click the OK button. Microsoft Excel attaches the text as described in the table below, selects the text, and displays it in the formula bar.

You can then edit the text in the formula bar. When the text is as you want it, press Enter to enter the text in the chart. To format the text, use the Format Text command.

Attach Text to

Chart Title	Centers the word "Title" above the plot area
Value Axis	Centers the letter "Y" (for y-axis) along the value axis
Category Axis	Centers the letter "X" (for x-axis) along the category axis
Series or Data Point	Attaches text to a series or a data point in a series

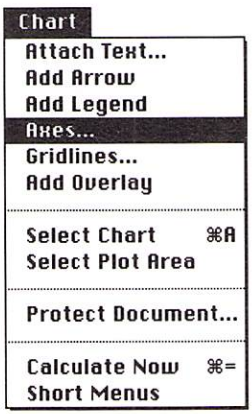
To attach text to a data point, type the plot order number of the series containing the data point in the Series Number box, and type the data point number in the Point Number box. Microsoft Excel uses the value for that data point as the text and puts it next to the marker for the data point. For more information on plot order and data points, see **Chart data series.**

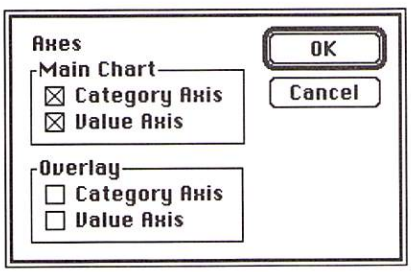
The only time you don't have to specify both the series number and the point number is when you want to attach text to an area in an area chart. If you leave the Point Number box blank, Microsoft Excel uses the series title as the text and centers it in the area for that series.

For more information on charts, see **Chart.** For more information on adding attached text to a chart, see **Chart text.**

Chart Axes command

Controls whether the axes are visible. When there is no overlay chart, the options for overlay chart axes are not shown.





Main Chart Controls the axes displayed on the main chart. You can turn on the main chart's category axis, value axis, both, or neither.

Overlay Controls the axes displayed on the overlay chart. You can turn on the overlay chart's category axis, value axis, both, or neither.

You can change the appearance of axes with the Format Patterns command. You can change other properties of the axes, such as the ranges and where axes cross each other, with the Format Scale command.

For more information on chart axes, see **Chart axis.**

Chart axis

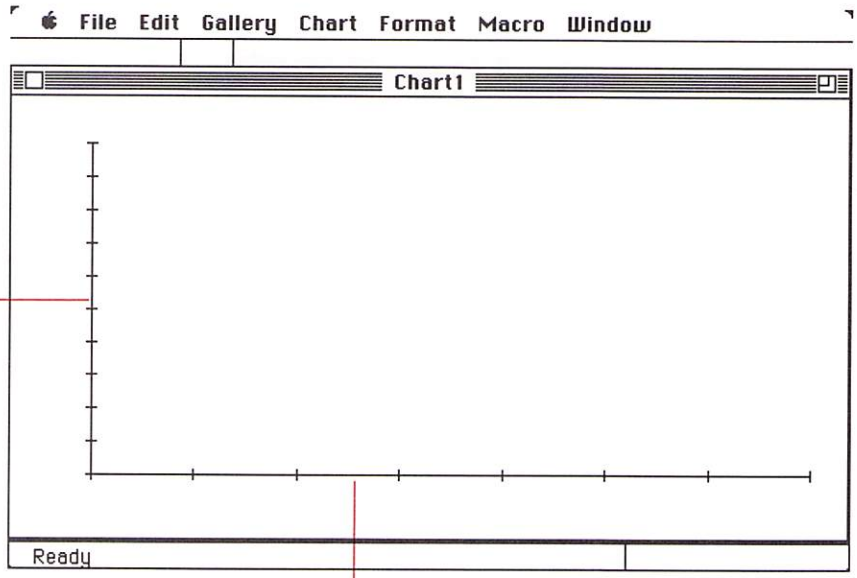
An **axis** is a line used as the defining scale or category against which chart data is plotted. An axis provides a frame of reference for measurement or comparison in a chart.

This topic explains:

- Value and category axes
- Adding gridlines to a chart
- Formatting chart axes

Value and Category Axes

You may be familiar with other terms for axes:



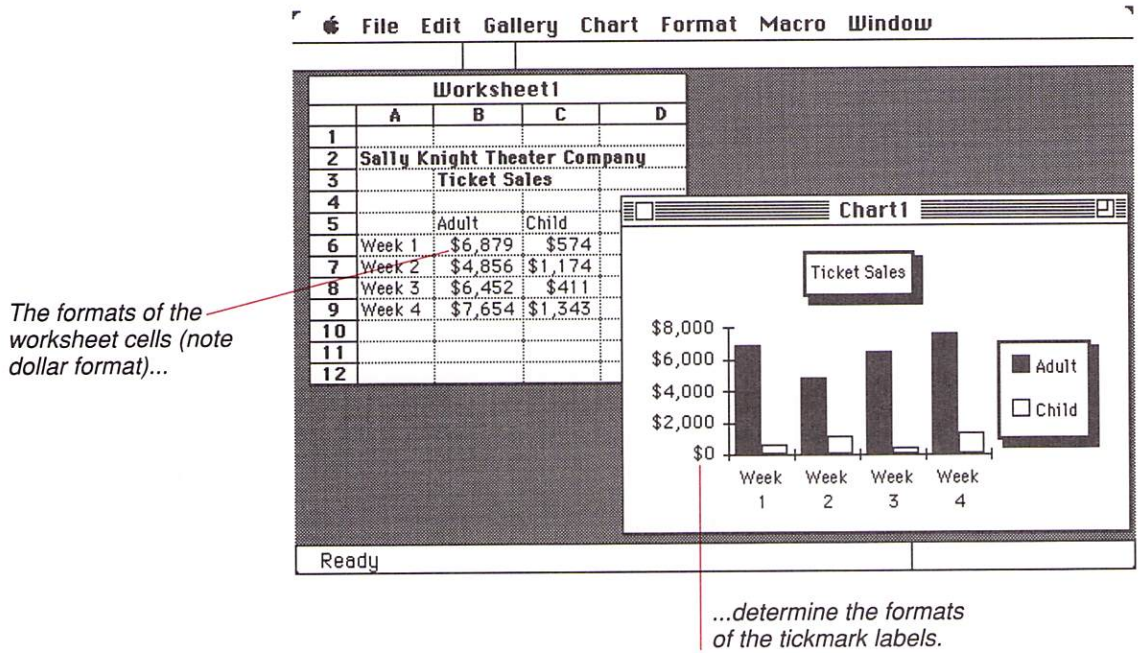
Microsoft Excel: Value axis
Equivalent terms:
Y-axis
Vertical axis
Dependent variable

Microsoft Excel: Category axis
Equivalent terms:
X-axis
Horizontal axis
Independent variable

Note Bar charts reverse this scheme: the value axis is the horizontal axis and the category axis is the vertical axis.

A pie chart has no axes. Area, bar, column, line, and scatter charts each have two axes. A combination chart can have up to four axes, since the overlay chart in a combination chart may have up to two additional axes, possibly in different scales than on the main chart.

When you first create a chart using worksheet data, Microsoft Excel creates axes with tickmark labels from the source worksheet, as shown in the following illustration:



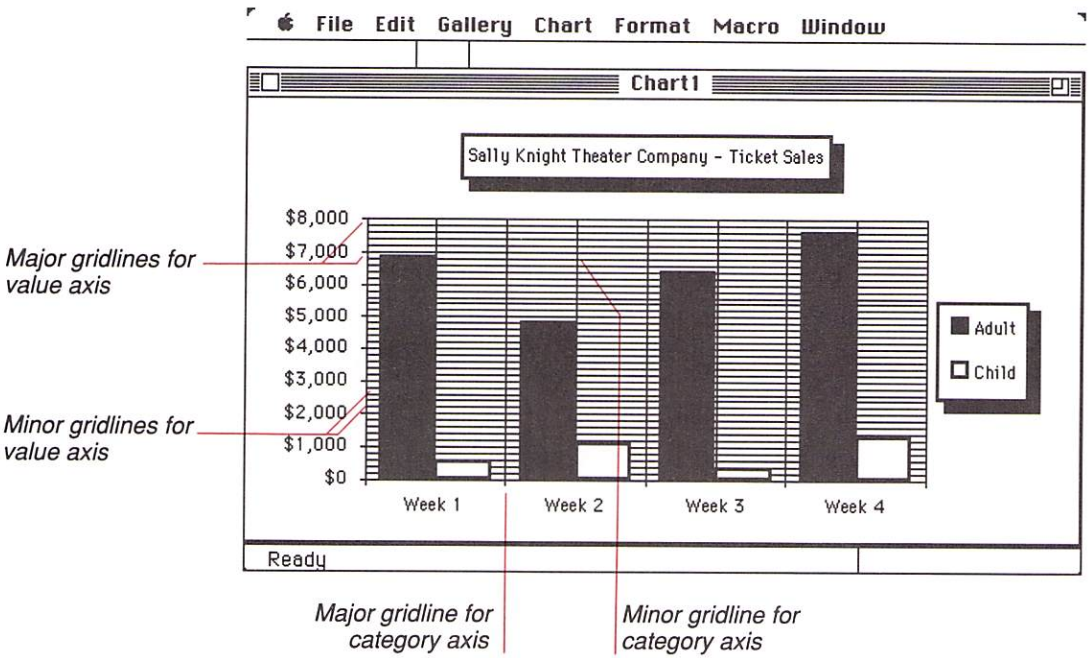
The worksheet cells from which values and categories are taken determine the format of tickmark labels on the axes. In the previous illustration, the worksheet cells display values in dollars, so the tickmark labels on the value axis also appear in dollars.

You can change the number format of tickmark labels along the value axis by reformatting the worksheet cells with the Format Number command. For more information, see **Number.**

You can change the content of a tickmark label by editing the worksheet cell in the formula bar. For more information, see **Formula bar.** For information on reformatting tickmarks and tickmark labels, see "Formatting Chart Axes," later in this topic.

Adding Gridlines to a Chart

Gridlines are lines that extend from each tickmark on an axis across the plot area. They help guide the eye to the tickmark values or categories. The following illustration shows the types of gridlines you can add to a chart:



The Chart Gridlines command controls whether major and minor gridlines appear in the main chart.

1. Choose Chart Gridlines.
2. Turn on the gridline check boxes you want.
3. Click the OK button.

To remove gridlines from a chart:

1. Choose Chart Gridlines.
2. Turn off the check boxes for the gridlines you want removed.
3. Click the OK button.

For more information, see **Chart Gridlines command.**

Formatting Chart Axes

You can control the following characteristics of chart axes:

For	You can
Category axis	Specify where the value axis crosses. Specify the number of categories between tickmarks and tickmark labels. Make the scale logarithmic. Reverse the order of categories along the axis.
Value axis (both axes in scatter charts)	Specify where the category (or value) axis crosses. Specify the range of values displayed. Specify the interval between tick-marks. Make the scale logarithmic. Reverse the order of values (or categories) along the axis.
Both axes	Format style, color, weight, tickmark type, and tickmark label position. Format tickmark labels with a variety of options for color, font, and style.

Note If your data extends over a wide range, you may want to format one or both axes with logarithmic scales to spread out the lower values, while keeping the higher values within the plot area of the chart.

You can quickly move directly between the dialog boxes for the Format Font, Format Patterns, and Format Scale commands by using the command buttons in each dialog box. Clicking the buttons with ellipses bypasses the corresponding menu commands. Dialog box options vary, depending on whether a category or value axis is selected.

1. Select the axis you want to format.
2. To change the intersection of axes or make numeric adjustments, choose Format Scale.

   To format the physical appearance of axes, tickmarks, or tickmark labels, choose Format Patterns.

   To format text attached to axes, choose Format Font.

3. Click the options you want or make the desired adjustments.
4. If you want to make other changes or adjustments to the axis, click the Font, Patterns, or Scale button.
5. Click the OK button.

For more information, see **Format Font command, Format Patterns command,** and **Format Scale command.** For information on axis labels, see **Chart text.**

Related Information

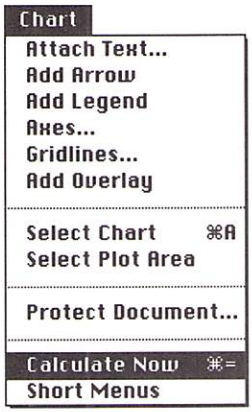
Reference

For information on	See
Chart basics	Chart
Controlling how data series are plotted	Chart data series Series formula
Overlay charts and axes	Overlay chart

Sampler

Changing Coordinate Systems

Chart Calculate Now command



Calculates all open worksheets and redraws dependent charts according to the settings in the Options Calculation dialog box (worksheet menu bar). Microsoft Excel does not redraw a chart if all the worksheets it is dependent on are closed. Chart Calculate Now works the same way the Options Calculate Now command works when a worksheet is active.

Use this command when you are using manual calculation and want to see the effect of changes you have made in formulas.

For information on the way documents are calculated, see **Calculation.** For information on calculation settings, see **Options Calculation command.**

Chart data series

A **data series** is a group of related numeric values within a category plotted on a chart. A chart consists of one or more data series.

This topic explains:

- How Microsoft Excel plots a chart

  How Microsoft Excel defines data series

- Series formula
- Working with data series

  Using a multiple selection to control plotting
  Adding data series from a worksheet
  Adding data series from another chart
  Formatting data series and data points
  Deleting a data series from a chart

Note A chart data series is different from the type of series you create with the Data Series command. You use the Data Series command in a worksheet to enter a row or column of dates or numbers that increase by a constant amount or factor. For more information, see **Data Series command.**

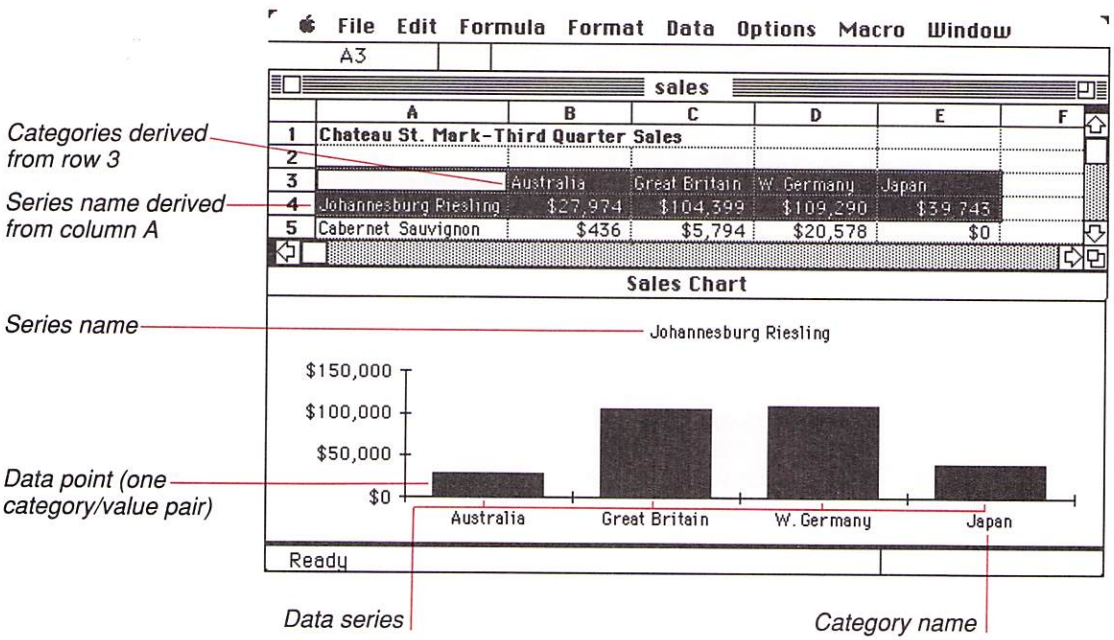
How Microsoft Excel Plots a Chart

Understanding how Microsoft Excel defines data series and plots a chart is useful for these tasks:

- Adding data series from a worksheet or another chart to an existing chart
- Controlling how data series are defined and plotted in a chart

When you select cells in a worksheet and create a new chart, Microsoft Excel groups the related values and plots them as data series in the chart. A data series consists of numeric values grouped by categories. A data point is one value plotted in relation to its category.

The following illustration shows how Microsoft Excel organizes and plots one data series from a worksheet selection:



Values in a data series must be numeric. Categories can be text or numeric data.

Note Microsoft Excel plots non-numeric values in a data series as follows: any sequence of characters or the logical value FALSE is plotted as 0; the logical value TRUE is plotted as 1.

Line and scatter charts make special adjustments when blank cells or cells with the error value #N/A are part of the selection. A blank cell causes a break in the plot line; #N/A causes the previous point and the next point to be joined, skipping the #N/A point. For more information on line and scatter charts, see **Gallery Line command** and **Gallery Scatter command.**

How Microsoft Excel Defines Data Series

Microsoft Excel defines a data series from a worksheet selection by first determining whether or not the selection includes categories and series names. Then it organizes the series values.

- **How Microsoft Excel chooses categories and series names from the worksheet selection** — If the upper-left cell of the worksheet selection is blank, Microsoft Excel uses the first row and the first column for the series names and categories. Whether the row or column is used for series names or categories depends on the shape of the selection.

  If the upper-left cell is not blank, Microsoft Excel looks for non-numeric or date-formatted values in the first row and then in the first column. If it finds such data, Microsoft Excel uses the cell values as categories or series names, again depending on the shape of the selection. If only the first row is formatted as dates, the first row becomes the categories and the data is organized by rows. If only the first column is formatted as dates, the first column becomes the categories and the data is organized by columns.

- **How Microsoft Excel organizes series values from the worksheet selection** — Unless you specify differently, Microsoft Excel assumes you want fewer data series than data points. From the shape of the worksheet selection — excluding categories and series names — Microsoft Excel determines whether to use the selection's rows or columns for the chart's data series.

  If the selection has more rows than columns, each column is a data series. Otherwise, each row is a data series.

The following illustrations show how Microsoft Excel interprets different kinds of worksheet selections for creating charts. In the first two illustrations, the blank upper-left cell of the selection causes Microsoft Excel to plot categories and series names. (Legends are added separately.)

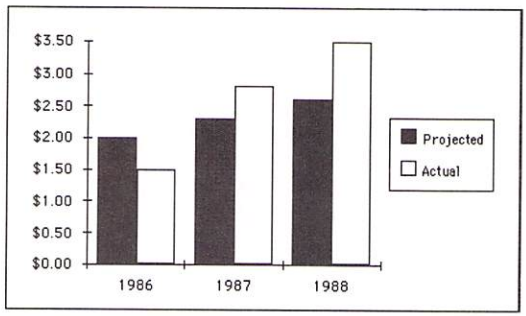
Worksheet selection, wider than tall

Categories

Series names

	1986	1987	1988
Projected	$2.0	$2.3	$2.6
Actual	$1.5	$2.8	$3.5

Series are organized by rows.



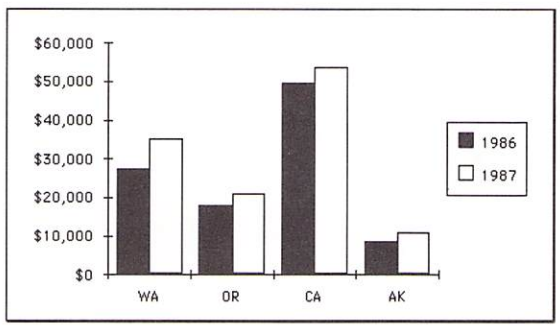
Worksheet selection, taller than wide

Series names

Categories

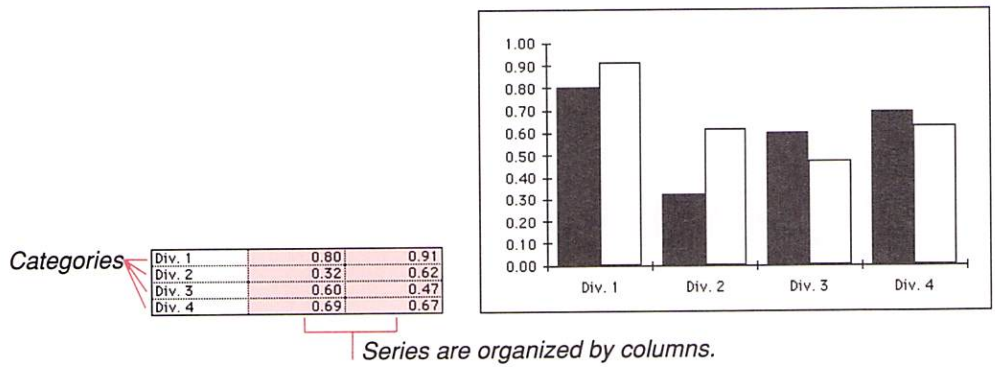
	1986	1987
WA	$27,350	$35,212
OR	$17,892	$20,950
CA	$49,781	$53,647
AK	$8,563	$10,898

Series are organized by columns.

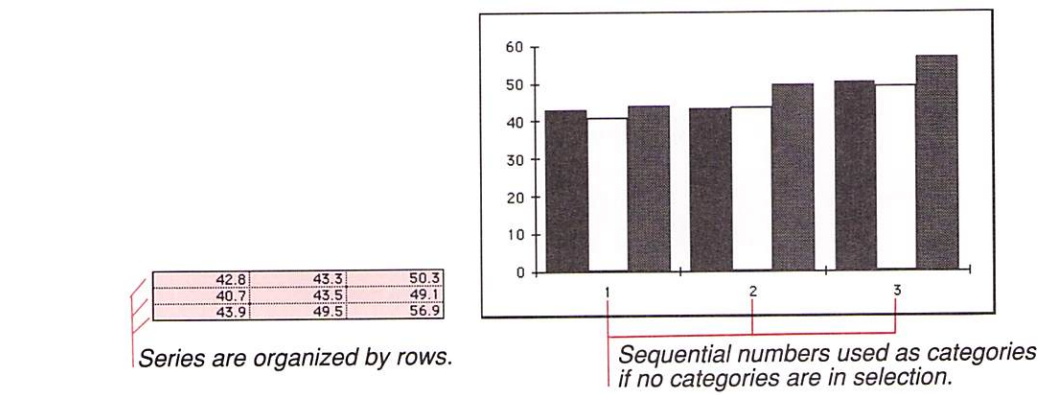


The following two illustrations show how Microsoft Excel plots selections that lack series or category names.

Worksheet selection, text categories and values only



Worksheet selection, values only

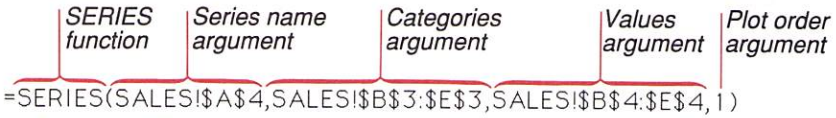


For an explanation of how Microsoft Excel plots a multiple selection, see "Using a Multiple Selection to Control Plotting," later in this topic.

Note Scatter and pie charts have different requirements for plotting data than other types of charts with two axes (area, bar, column, and line charts). For more information, see **Scatter chart** and **Gallery Pie command**.

Series Formula

If you want to view the full details of how Microsoft Excel defines data series, select any marker in a data series and look at the formula bar. There you'll see the series formula — the exact blueprint for how Microsoft Excel plots a given data series. The series formula has the following parts:



You can create or delete data series with series formulas. You can also edit these formulas to change data series names as they appear on the chart legend. For more information, see **Series formula.**

Working with Data Series

This section explains how to control the plotting and appearance of data series in your charts.

Using a Multiple Selection to Control Plotting

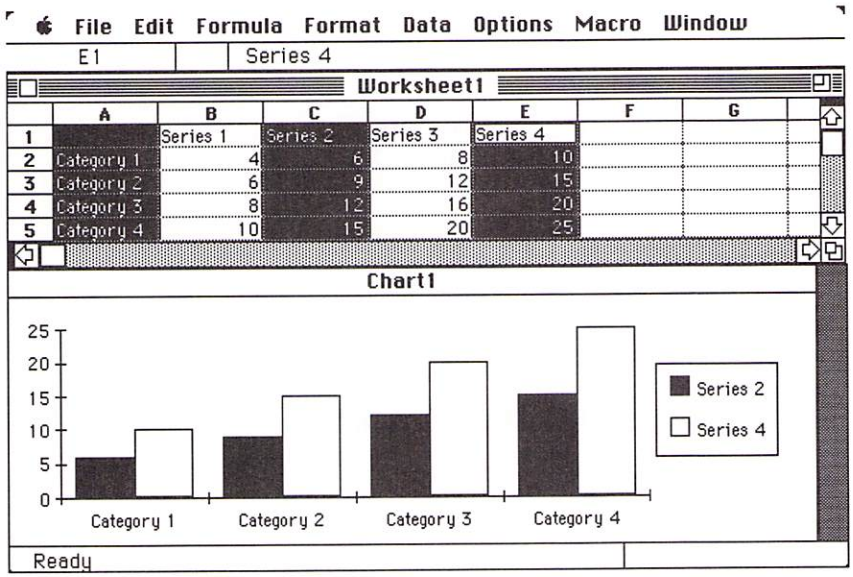
In addition to plotting a single rectangular range of cells on a worksheet, you can also plot a multiple selection — a combination of discontinuous ranges. Plotting a multiple selection is useful for:

- Selectively charting rows or columns of worksheet data
- Overriding Microsoft Excel default plotting assumptions

When you plot a multiple selection, Microsoft Excel looks at the first range selected to see if it includes dates or non-numeric data, and whether to organize the data by columns or rows. If the first range selected includes dates or non-numeric data, this data becomes the categories in the chart. If the first range also includes values, Microsoft Excel determines whether there are series names; otherwise, the second range determines series names.

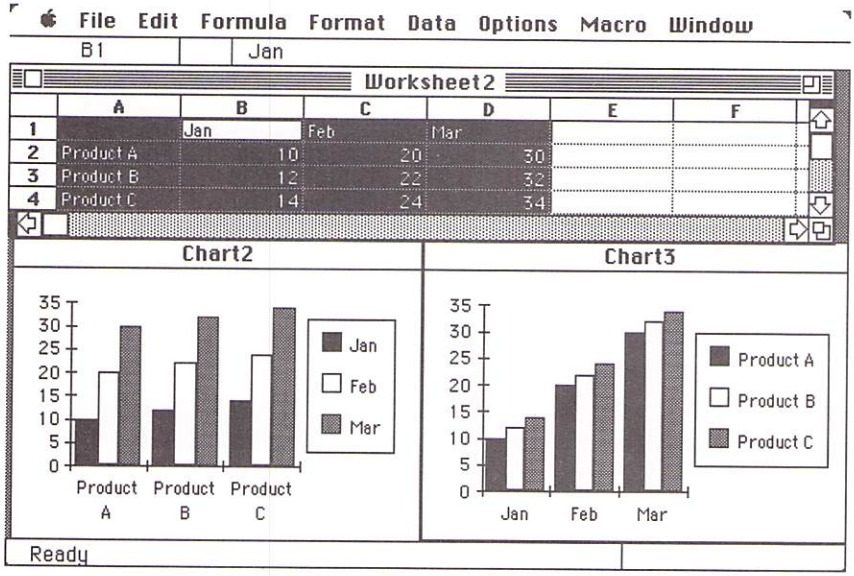
As for a regular selection, Microsoft Excel organizes values in a multiple selection into data series by determining whether there are fewer columns or rows in the first range selected. The ranges in a multiple selection — excluding series names and categories — should be rectangles of the same size or increments thereof. In other words, if the separate selections — minus categories and series names — were combined, they would form one large rectangle.

For example, selecting only the data in columns A, C, and E of the following worksheet and choosing the File New command creates Chart1, as shown here:



	A	B	C	D	E	F	G
1		Series 1	Series 2	Series 3	Series 4		
2	Category 1	4	6	8	10		
3	Category 2	6	9	12	15		
4	Category 3	8	12	16	20		
5	Category 4	10	15	20	25		

In the following illustration, making the multiple selection A1:A4 and then B1:D4 in Worksheet2 and choosing the File New command creates Chart2. Chart3 shows how the chart would look when created with a single selection and Microsoft Excel default plotting. Notice how categories and values are organized and plotted differently in the two charts.



To control plotting with a multiple selection:

1. Make the multiple selection.
   To make a multiple selection, drag through the first selection; then hold down the Command key and drag through each additional selection.
2. Choose File New.
3. Click Chart.
4. Click the OK button.

You can also control how a data series is plotted with the Edit Paste Special command. See the next section in this topic, "Adding Data Series from a Worksheet."

Adding Data Series from a Worksheet

You can copy data series from a worksheet and add them to an existing chart. This procedure is useful for creating a summary chart that consolidates different data series from several worksheets.

There are two ways to copy data series from a worksheet to a chart:

- Use the Edit Copy and Edit Paste commands to paste the data series, letting Microsoft Excel control how the data series are organized and plotted. In this case, Microsoft Excel plots data according to the defaults described earlier in this topic under "How Microsoft Excel Defines Data Series."
- Use the Edit Copy and Edit Paste Special commands to paste the data series and control how the data series are organized and plotted. Here, you use the options in the Edit Paste Special dialog box to specify whether you want to make each row or column in the worksheet selection a data series. You can also specify the source cells for data series names and categories.

Tip Before starting either procedure, you may want to use the Window Arrange All command so you can see both the worksheet and chart windows on your screen.

To add data series and let Microsoft Excel control plotting

1. Make sure both the worksheet and chart documents are open.
2. Select the worksheet data.
3. Choose Edit Copy.
4. Activate the chart window.
5. Choose Edit Paste.

To add data series and control data plotting (full menus)

1. Make sure both the worksheet and chart documents are open.
2. Select the worksheet data.
3. Choose Edit Copy.
4. Activate the chart window.
5. Choose Edit Paste Special.
6. Click the options you want.
7. Click the OK button.

For more information, see **Edit Paste command** and **Edit Paste Special command.**

Adding Data Series from Another Chart

There are two ways to add data series from another chart:

- Use the Edit Copy and Edit Paste commands to paste data series and their formats from one chart to another.
- Use the Edit Copy and Edit Paste Special commands to selectively paste all data series, their formats, or both.

Important When you add data series from another chart with the Edit Paste command, Microsoft Excel replaces the format of the active chart with that of the copied chart.

To add all data series and formats from another chart

1. Make sure both chart documents are open.
2. Activate the chart window that contains the data series you want to add.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window containing the chart you want to modify.
6. Choose Edit Paste.

To add data series and/or formats from another chart (full menus)

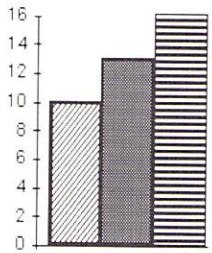
1. Make sure both chart documents are open.
2. Activate the chart window that contains the data series you want to add.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window containing the chart you want to modify.
6. Choose Edit Paste Special.
7. In the dialog box, specify whether you want data series, their formats, or both pasted into the chart.

   Click the Formulas option if you want to paste only data series and no formats.
8. Click the OK button.

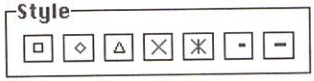
For more information, see **Edit Paste command** and **Edit Paste Special command.**

Formatting Data Series and Data Points

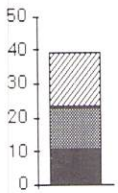
You can format data series and data points with the options shown here. These options also apply to overlay charts.



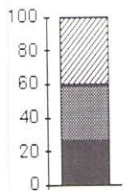
Use a variety of patterns and colors for column and bar chart series markers; modify border patterns and weights of the markers (Format Patterns).



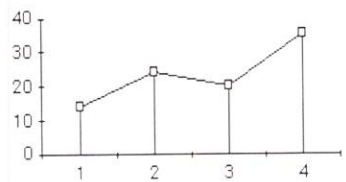
Use a variety of symbols for line and scatter chart series markers; modify colors and patterns for markers and lines (Format Patterns).



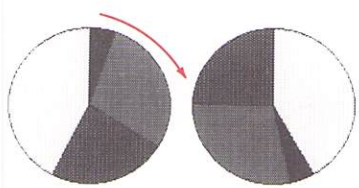
Stack or overlap bar and column chart series markers (Format Main Chart or Format Overlay).



Show each value in a category as a percentage of all values in that category (100% option — Format Main Chart or Format Overlay).



Use drop lines or hi-lo lines in line charts (Format Main Chart or Format Overlay).



Control the angle of the first slice in a pie chart (Format Main Chart or Format Overlay).

For information on each option, see **Format Main Chart command** and **Format Patterns command.**

With the Format Main Chart or Format Overlay command, you can also use the Cluster Spacing option to specify the amount of space between bars or columns. If you are working with a chart that has only one data series, the Vary by Categories option automatically applies a different pattern to each marker in the data series.

Tip Before you make formatting changes in a new chart, check the Gallery commands for the format you want to use. You can find many of the formats shown here (for example, stacked or overlapped bars or columns) among the built-in formats in the gallery. For more information, see **Gallery Area, Gallery Bar, Gallery Column, Gallery Line, Gallery Pie, Gallery Scatter,** and **Gallery Combination commands.**

If you've already changed formatting, use one of the following procedures to format data series and data points. For either procedure, dialog box options vary according to the type of chart you're working on. If the chart has only one data series, some options format individual data points within a data series.

To format marker patterns, colors, lines, and borders

1. Select the data series.
2. Choose Format Patterns.
3. Click the options you want.
4. Click the OK button.

To format stacking, 100%, vary by categories, drop/hi-lo lines, overlapping, cluster spacing, or pie slice angle

1. Activate the chart window.
2. Choose Format Main Chart or Format Overlay (full menus).
3. Click the options you want.
4. Click the OK button.

For more information, see **Format Patterns command, Format Main Chart command,** and **Format Overlay command.** For information on working with overlay charts, see **Overlay chart.**

Deleting a Data Series from a Chart

You delete a data series from a chart by erasing the series formula for that data series. The series formula contains all the instructions Microsoft Excel uses to plot the data series. Deleting a data series from a chart does not delete the source data in the worksheet.

1. Select any marker of the data series you want to delete.
   The formula bar displays the series formula.
2. Press Backspace.
3. Press Enter or click the enter box.
   Microsoft Excel deletes the data series and redraws the chart.

For more information, see **Series formula.**

Related Information

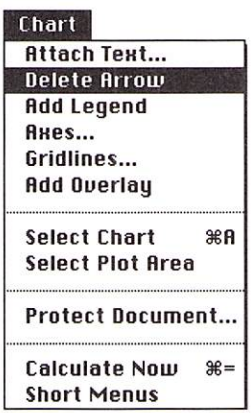
Reference

For information on	See
Chart basics, chart formatting options	Chart
Adding a data series or data point label	Chart text
Changing the data series name on a chart legend	Series formula
Working with overlay charts	Overlay chart

Sampler

Changing Coordinate Systems

Chart Delete Arrow command



Removes the selected arrow from the chart. If an arrow is not selected, or there are no arrows on the active chart, the command changes to Chart Add Arrow.

For more information on chart arrows, see **Chart arrow.**

Chart Delete Legend command

Removes the legend from a chart. When you remove the legend, the plot area expands to use the extra space. This command does not appear unless the legend is selected.

After you choose Chart Delete Legend, the command changes to Chart Add Legend. If you later choose the Chart Add Legend command for the same chart, the legend will have the same format as the one you deleted. You can format the legend with the Format Legend, Format Patterns, and Format Font commands.

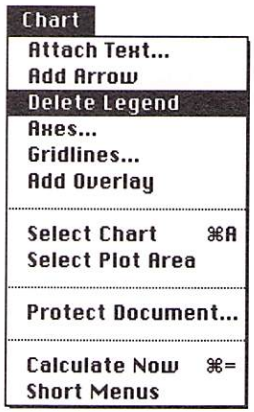


Chart Delete Overlay command

Recombines the overlay chart with the main chart to form a single, main chart. This command only appears when the active chart has an overlay chart.

When you delete an overlay chart, all the data series on the overlay chart are added to the main chart and the command changes to Chart Add Overlay.

You can change the overlay chart type with the Format Overlay command.

For more information on charts, see **Chart.**

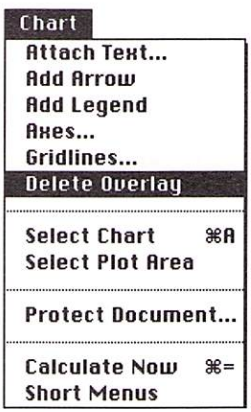
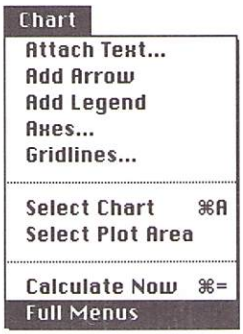


Chart Full Menus command

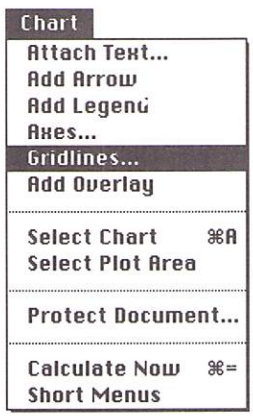


Changes all menus to show all commands instead of only the short menu commands. Chart Full Menus affects all menus for all documents, including worksheets and macro sheets.

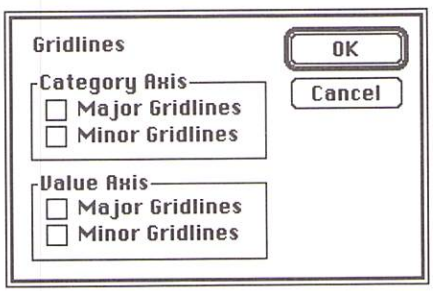
Use full menus when you want to use a command that isn't available on short menus.

Full Menus appears on the Chart menu when you are using short menus. Chart Full Menus works the same as the Options Full Menus command, which appears when you are using short menus and a worksheet or macro sheet is the active document.

Chart Gridlines command



Controls whether the major and minor gridlines are visible. Gridlines are attached to the main chart axes. You can change the appearance of gridlines with the Format Patterns command.



Category Axis Controls the gridlines for the category axis. You can turn on the major gridlines, the minor gridlines, both, or neither.

Value Axis Controls the gridlines for the value axis. You can turn on the major gridlines, the minor gridlines, both, or neither.

For more information on charts, see **Chart**.

Chart legend

A **chart legend** identifies the different markers in a chart. A legend includes each pattern or symbol used as a marker in the chart, followed by the name of the data series (when there is more than one series) or by the category name (when the chart plots a single data series).

This topic explains:

- Adding a legend
- Moving a legend
- Formatting a legend
- Deleting a legend

Adding a Legend

▣ With the chart window active, choose Chart Add Legend.

Microsoft Excel places a legend at the right of the plot area, and resizes the plot area to accommodate the legend.

If your legend appears without text, recreate your chart, making sure to select the row and column names of the data being plotted.

Note For legend text, Microsoft Excel automatically uses the data series name — if any — from the series formula. For charts with only one data series, Microsoft Excel uses the category names. You can add or change legend text by editing the series formula. For more information, see **Series formula.**

Moving a Legend

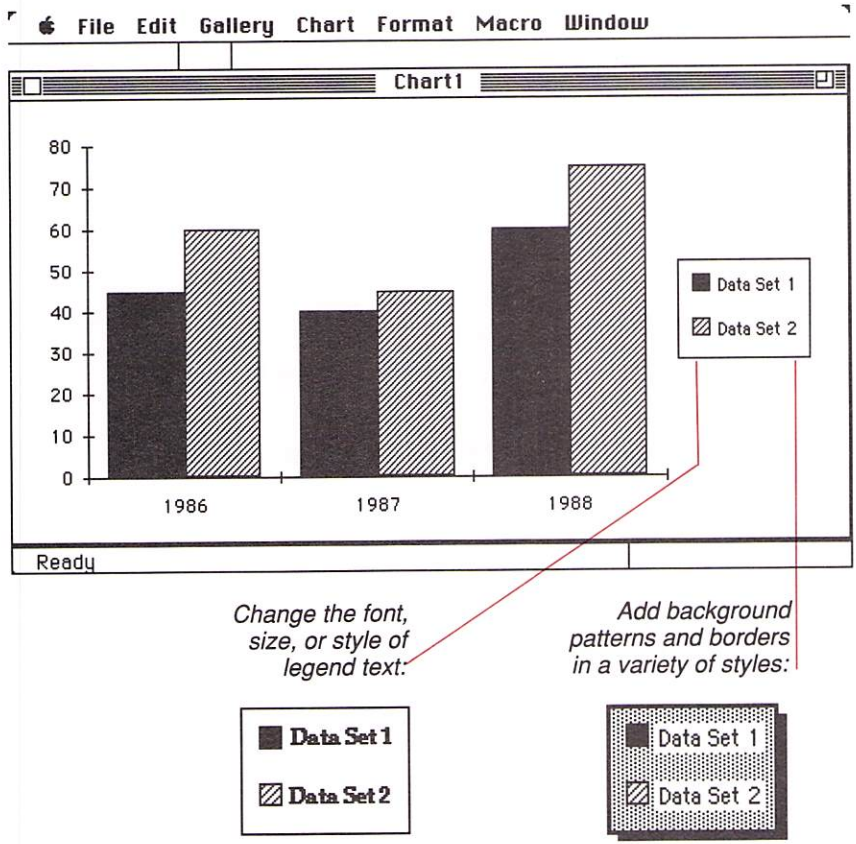
You can position a legend in four different locations on a chart: at the right (default), in the upper-right corner, or centered at the top or bottom.

1. Select the legend.
2. Choose Format Legend.
3. Click the option for the legend position you want.
4. Click the OK button.

For more information, see **Format Legend command.**

Formatting a Legend

The following illustration shows the two basic ways you can format a chart legend:



Experiment with the different options to see which combinations work best.

To format legend background or border

1. Select the legend.
2. Choose Format Patterns.
3. Click the options you want.
4. Click the OK button.

To format legend text

1. Select the legend.
2. Choose Format Font.
3. Click the options you want.
4. Click the OK button.

For more information, see **Format Patterns command** and **Format Font command.**

Deleting a Legend

If a chart containing a legend is active, the Chart Add Legend command changes to Chart Delete Legend on the menu.

▣ Choose Chart Delete Legend.

Related Information

Reference

For information on	See
Chart basics, overview of formatting options	Chart
Using text in charts	Chart text
Formatting series markers	Chart data series

Chart plot area

The **chart plot area** is the region, bounded by and including the axes, in which Microsoft Excel plots your data. The plot area of a pie chart is the smallest rectangle enclosing the pie.

Formatting the Plot Area

You can change the background pattern, border pattern, or border weight of the plot area.

1. Choose Chart Select Plot Area to select the plot area.
2. Choose Format Patterns.
3. Click the options you want.
4. Click the OK button.

For information about the chart background area, see **Chart area.**

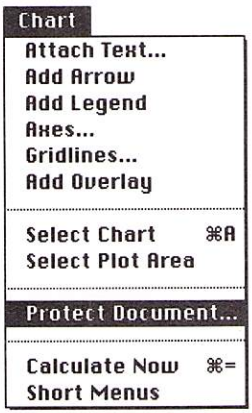
Related Information

Reference

For information on	See
Chart basics, overview of chart formats	Chart
Axes and gridlines	Chart axis

Chart Protect Document command

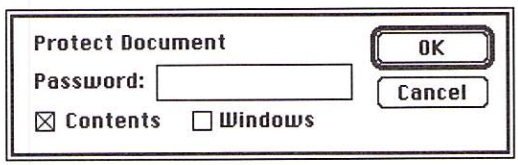
(Full Menus)



Controls whether a chart's data series and formats can be altered, and whether its window can be moved, resized, or otherwise altered. When the active chart is protected, the command changes to Chart Unprotect Document.

Chart Protect Document is similar to the Options Protect Document command, which protects worksheets and macro sheets.

For more information, see **Protecting or hiding data, Options Protect Document command,** and **Chart Unprotect Document command.**



Password Type a password, using any combination of letters, numbers, and symbols. A password can be up to 16 characters long. The password you type when you remove protection from a chart must be identical to the password you typed when you protected the chart.

Important If you lose your password, you cannot remove protection from the chart. It's a good idea to keep a list of your passwords in a safe place.

If you are protecting your chart from yourself to avoid inadvertent changes, you may want to protect your document without a password. If you click the OK button in the Protect Document dialog box without typing a password, you won't need to type a password when you unprotect the document.

Using a password to protect a document from being changed is different from using a password to protect a document from being opened. For more information on using a password to protect a document from being opened, see **File Save As command.**

Contents Protects all aspects of a chart from changes, except its window.

Windows Prevents the chart's window from being changed, including sizing, moving, and hiding the chart's window.

Chart Select Chart command

Selects the entire chart in the active window.

When the chart is selected, you can use the following commands:

Format Font	Changes the font, size, style, and color used by all text in the chart
Format Patterns	Changes the border style, border color, border weight, background pattern, background color, or foreground color
Format Main Chart (and Format Overlay if there is an overlay chart)	Controls chart type and chart formats
Edit Clear	Clears the chart's formats and data series
Edit Copy	Copies the chart's formats or data series to another chart

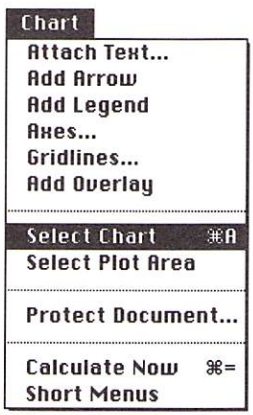


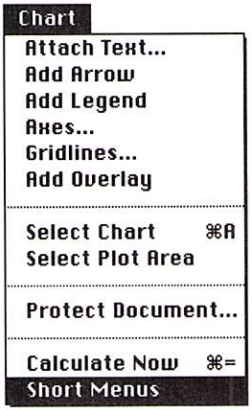
Chart Select Plot Area command

Selects the plot area of the chart in the active window.

The plot area of a chart is the area bounded by the axes. When the plot area is selected, you can use the Format Patterns command to change the border style, border color, border weight, background pattern, background color, or foreground color.

Chart Short Menus command

(Full Menus)



Changes the menus to show fewer commands. Chart Short Menus affects menus for all documents, including worksheets and macro sheets.

Short menus are designed to contain the commands you use most often, so you can find them quickly and use Microsoft Excel more efficiently. Use short menus for routine work, or when you are first learning to use Microsoft Excel.

Short Menus appears on the Chart menu when you are using full menus. Chart Short Menus works the same as the Options Short Menus command, which appears when you are using full menus and a worksheet or macro sheet is the active document.

Chart text

Chart text describes data or objects in a chart. You can attach text to a specific part of the chart or add unattached text. You can link any chart text to a worksheet cell, so that the chart text always reflects any changes on the worksheet. In addition, you can format chart text with a variety of options for fonts, borders, background patterns, and colors.

This topic explains:

- Adding text to a chart

  Types of chart text
  Adding attached text to a chart
  Adding unattached text to a chart
  Linking chart text to a worksheet

- Changing chart text

  Editing chart text
  Formatting chart text
  Moving unattached text
  Resizing the text area for unattached text
  Deleting chart text

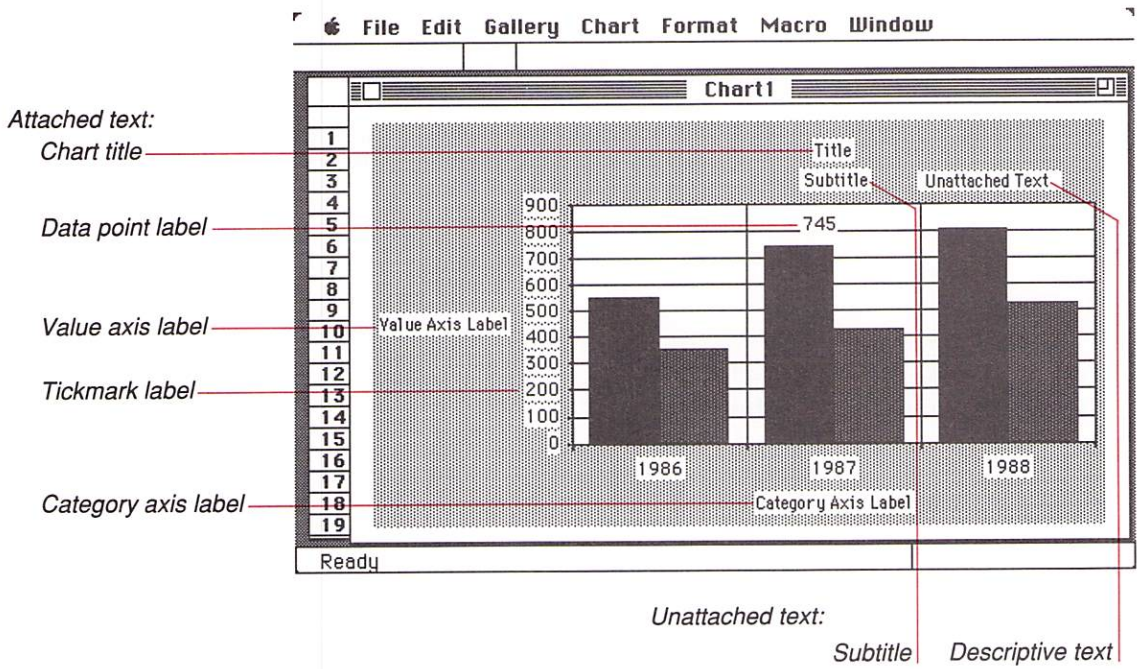
Adding Text to a Chart

Types of Chart Text

You can use two types of chart text:

- **Attached text** is linked to a specific chart object, such as an axis. This text moves with the object if you move or resize the object.
- **Unattached text** is not linked to a chart object. You can size or move this type of text anywhere in the chart.

The following chart shows examples of attached and unattached text:



Adding Attached Text to a Chart

You can attach text for a chart title, category axis label, value axis label, and data series or data point labels.

1. Choose Chart Attach Text.
2. Select the option for the part of the chart to which you want the text attached.

   If you select the Series or Data Point option, you then type the series or data point you want to attach text to in the Series Number and Point Number boxes. If you selected a series marker before choosing the Chart Attach Text command, these boxes show which data point and series you selected.
3. Click the OK button.

   Microsoft Excel provides default text surrounded by white selection squares.
4. To change the text, edit it in the formula bar, just as you would edit text for a worksheet cell.

   To insert a line break in the text, press Command+Return.

Note To add or change a data series name in a chart legend, you edit the series formula that Microsoft Excel uses to plot the data series. For information on editing a series formula, see **Series formula.**

For more information, see **Chart Attach Text command.**

Adding Unattached Text to a Chart

Use unattached text for subtitles, for comments on chart objects and data, or with chart arrows to emphasize elements in a chart.

1. Make sure no other text or data series in the chart is selected.
2. Type the text you want.
   The text appears in the formula bar as you type. To insert a line break in the text, press Command+Return.
3. Press Enter or click the enter box.

Microsoft Excel places the text in the chart and surrounds it with black selection squares. You can move the text and change the size of the text area (see "Changing Chart Text," later in this topic).

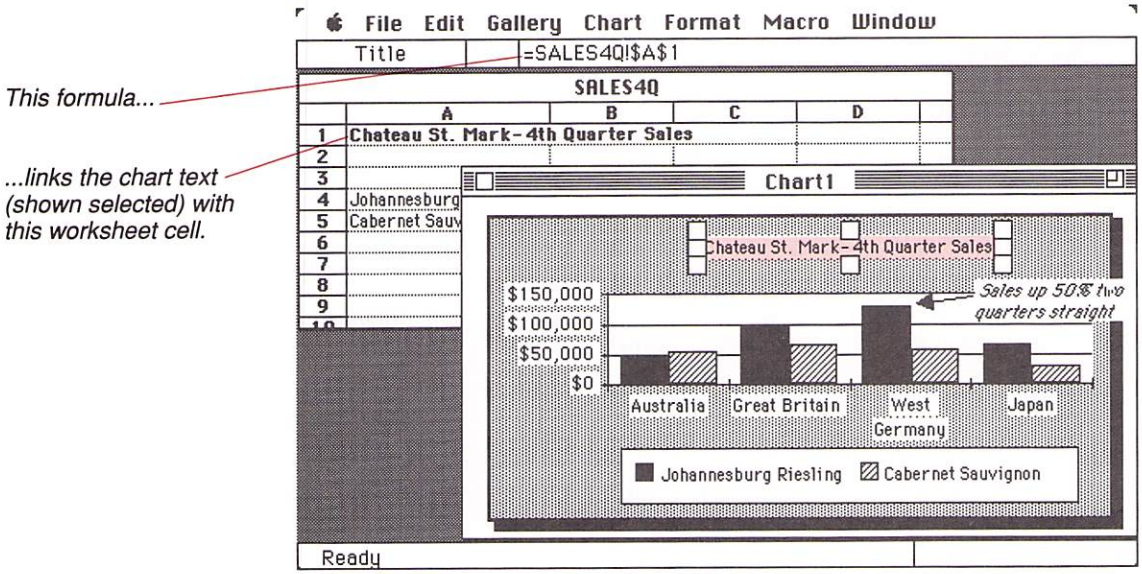
Linking Chart Text to a Worksheet

You can link attached or unattached text in a chart to a worksheet cell. Then any change on the worksheet is reflected in the chart text. This is an optional linking feature in addition to the automatic links between worksheet values and the data plotted in the chart.

You create linked text with a formula that includes an external reference — a reference to the source worksheet. The following rules apply to the formula:

- The source worksheet must be open when you create the formula.
- The external reference can be to a name or a single cell. If the external reference is to a name, the name must refer to only one cell.
- The external reference can be an absolute reference or any type of constant — text, number, logical value, or error value.

In the following illustration, the chart text is selected so you can see the formula that creates the linked text:



The syntax of the example formula is as follows:

Note If you change the worksheet, any linked chart is updated, even if the chart file is closed. When you reopen the chart, Microsoft Excel asks if you want to update references to nonresident sheets. Click the OK button to update the references. If you click the Cancel button, Microsoft Excel uses the stored version of the chart.

To link attached text to a worksheet

1. Choose Chart Attach Text.
2. Click the option for the part of the chart you want the text attached to.
3. Click the OK button.
4. With the default text selected, type an equal sign.
5. Activate the worksheet window and click the cell that contains the data you want for the text.

   You can also type the cell reference in the formula bar.
6. Press Enter or click the enter box.

To link unattached text to a worksheet

1. Make sure no text or data series is selected.
2. Type an equal sign.
3. Activate the worksheet window and click the cell that contains the data you want for the text.

   You can also type the cell reference in the formula bar.
4. Press Enter or click the enter box.

Changing Chart Text

Editing Chart Text

1. Select the text you want to edit.

   The selected text appears in the formula bar.

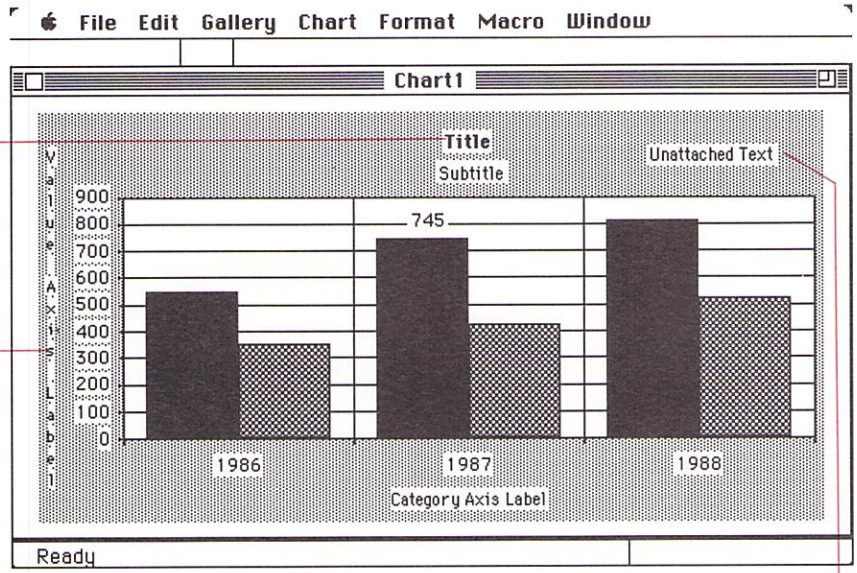
   If the text is linked to a worksheet, activate the worksheet and select the cell that contains the text.
2. Edit the text in the formula bar.

   To insert a line break in unlinked text, press Command + Return.
3. Press Enter or click the enter box.

Formatting Chart Text

You can format chart text in the following ways:

- Change font, font style, and font size.
- Change the orientation and alignment of attached text.
- Add background patterns and borders.



Use Format Patterns to add backgrounds and borders:

Title

Use Format Text to change orientation and alignment:

Value Axis Label

Use Format Font to change font size, style, and color:

Unattached Text

Try experimenting with different format options to see which combinations work best.

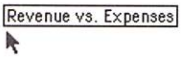
To change font, size, style, and color	To change orientation and alignment	To change background or border pattern, color, weight, or style
1 Select the text. To format all chart text, choose Chart Select Chart.	1 Select the text.	1 Select the text.
2 Choose Format Font.	2 Choose Format Text.	2 Choose Format Patterns.
3 Select the options you want.	3 Click the options you want.	3 Click the options you want.
4 Click the OK button.	4 Click the OK button.	4 Click the OK button.

For more information, see **Chart Select Chart command, Format Patterns command,** and **Format Text command.**

Moving Unattached Text

When you select unattached text for moving, you'll see the following:

The selected text is surrounded with black selection squares.



Once you start moving the text, the squares change into a positioning box that indicates text placement.

To move unattached text with the mouse:

1. Select the text.
2. Drag the text until it is where you want it.

To move unattached text with the keyboard:

1. Select the text.
2. Choose Format Move.
3. Using the Direction keys, move the positioning box until the text is where you want it.
4. Press Enter.

Resizing the Text Area for Unattached Text

You can resize the area containing unattached text. This determines line breaks within the text and the size of any special border you might add around the text (see "Formatting Chart Text," earlier in this topic). When you select the text area, you'll see the following:

The selected text is surrounded with black selection squares.

Once you start resizing the text, the squares change into a positioning box that shrinks and enlarges.

To resize the text area with the mouse:

1. Select the text.
2. Point to the black selection square on the corner or side you want to resize.
3. Drag to enlarge or shrink the positioning box until the text area is the size you want.

To resize the text area with the keyboard:

1. Select the text.
2. Choose Format Size.
3. Using the Direction keys, enlarge or shrink the positioning box until the text area is the size you want.
4. Press Enter.

Deleting Chart Text

1. Select the text.
2. If you gave the text a border or changed its background pattern, choose Format Patterns. Change the border and area patterns back to Invisible.
3. Press Backspace.
4. Press Enter or click the enter box.

Related Information

Reference

For information on	See
Chart basics, moving and selecting in a chart	Chart
Working with chart arrows	Chart arrow
Working with legends	Chart legend

Sampler

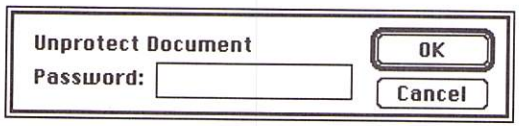
Analyzing the Break-even Point

Chart Unprotect Document command

(Full Menus)

Reverses the Chart Protect Document command. Chart Unprotect Document is available when a protected chart is active. When the active chart is unprotected, the command changes to Chart Protect Document.

If you did not use a password when you protected the document, Microsoft Excel unprotects the document without displaying the dialog box. If the chart was protected with a password, the following dialog box appears:



Password When you type the password for the chart, it must be identical to the password you typed when you protected the chart.

For more information, see **Protecting or hiding data, Options Protect Document command,** and **Chart Protect Document command.**

Circular reference

A **circular reference** occurs when a formula refers back to its own cell, either directly or through a series of formulas that refer back to the first cell. Normally, Microsoft Excel cannot calculate a circular reference because it never finds a value to use in the formula.

When a circular reference occurs, Microsoft Excel displays a message. To help you locate the circular reference, the status bar identifies a cell involved in the circular reference.

If you did not intend to create a circular reference, check the logic of your formulas. You may have to redesign the logic or edit the formulas to eliminate the circular references.

Although circular references are normally undesirable, you can build formulas that refer to each other. To calculate such formulas, you use a technique called iteration to resolve the circular reference. For more information on resolving circular references, see **Iteration.**

Color

If you have a color monitor and a color display card, you can use color to customize your Microsoft Excel workspace. The Microsoft Excel color display options provide many ways to enhance worksheet and chart displays.

This topic explains:

- Color display options

Color Display Options

You can enhance the display of your Microsoft Excel documents with the following color options:

- **Color gridlines and row/column headings in worksheet windows** — for easy document identification if multiple worksheets are open. Colors are set individually for each window, so you can also use this color option to easily distinguish multiple windows into the same worksheet. For more information, see **Display options.**
- **Color in worksheet number and text formats** — for emphasizing key data or for showing relationships between figures in your worksheets and charts. For more information, see **Format Number command.**
- **Color formats for patterns, markers, and borders in charts** — for creating high-quality graphics or for color-keying data in your charts to corresponding worksheet data. For more information, see **Format Patterns command.**

Available colors for these options are black, blue, cyan, green, magenta, red, white, and yellow.

Related Information

Reference

For information on	See
General overview of formatting worksheets and charts	Formatting a document
Hardware components	Hardware and system configuration

Column

On a Microsoft Excel worksheet, a **column** is one complete vertical line of cells. Microsoft Excel worksheets have 256 columns. In A1 reference style, the columns are labeled A through IV (A, B, C, . . .Z; AA, AB, AC, . . . IV). In R1C1 reference style, the columns are labeled 1 through 256.

This topic explains:

- Changing a column width
- Changing the width of multiple columns
- Inserting a column of blank cells
- Deleting a column
- Hiding a column
- Displaying a hidden column

Note All worksheet column concepts and procedures also apply to macro sheets.

Changing a Column Width

The standard column width in a new worksheet is 10 characters wide. When displaying formulas, Microsoft Excel doubles the displayed width of the columns. The doubled column width is also the standard column width in a new macro sheet.

If you enter data that does not fit within the column width, Microsoft Excel stores the data but displays number signs (###) in the cell. To fully display the data, you can increase the column width. If you enter text that does not fit within the column width, Microsoft Excel lets the text extend into adjacent cells if those cells are empty.

You can widen a column to the width of the worksheet window, narrow it to a fraction of one character, or hide it altogether. When you change the column width, the stored contents of the cells do not change; only the number of characters displayed changes.

Note Microsoft Excel sets column width based on the width of unformatted numeric characters. The number of characters actually displayed in a cell may vary depending on the font, font size, and font style (for example, bold or italic).

For information on displaying formulas or values, see **Display options.** For information on using fonts, see **Font.**

To change column width using the mouse:

1. Point to the vertical line at the right of the column heading.
2. When the pointer changes to a vertical bar with arrows to each side, drag right to widen the column or left to narrow it.

To change column width using the keyboard:

1. Select a column or a cell in the column you want to change.
2. Choose Format Column Width.
3. Type the column width you want in the Column Width box.
   To return a column to its standard 10-character width, turn on the Standard Width check box.
4. Click the OK button.

Changing the Width for Multiple Columns

Tip To select discontinuous columns, hold down the Command key when selecting each column after the first.

You select an entire row of cells by clicking the row number. You select an entire column by clicking the column heading. You select the entire worksheet by clicking the square to the left of the column headings.

1. Select a cell in each column you want to change.
2. Choose Format Column Width.

3. Type the column width you want in the Column Width box or turn on the Standard Width check box.
4. Click the OK button.

Inserting a Column of Blank Cells

1. Select the column to the right of where you want the new column.
2. Choose Edit Insert.

For more information, see **Inserting blank cells.**

Deleting a Column

1. Select the column you want to delete.
2. Choose Edit Delete.

For more information, see **Deleting and clearing data.**

Hiding a Column

You can hide columns. Hidden columns still exist on the worksheet but are not visible when you display or print the worksheet. For example, this procedure is useful if you have a column of supporting figures used in calculating formulas but which you don't need to see or print.

To hide a column:

1. Point to the vertical line at the right of the column heading.
2. When the pointer changes to a vertical bar with arrows to each side, drag to the left until it overlaps the line at the left side of the column heading.

To hide several columns quickly:

1. Select the columns or a cell in each column you want to hide.
2. Choose Format Column Width.
3. Type *0* (zero) in the Column Width box.
4. Click the OK button.

For information on hiding or protecting data for security purposes, see **Protecting or hiding data.**

Displaying a Hidden Column

To display a hidden column:

1. Point to the column heading line where the column is hidden.
2. When the pointer changes to a vertical bar with arrows to each side, move it just to the right of the column heading line.
3. Drag right.

   If you drag to the left of the column heading line, or start to the right and drag left, you will change the width of the visible column on the left instead of displaying the hidden column.

To display several hidden columns quickly:

1. Choose Formula Goto.
2. In the Reference box, type the reference of a cell in each of the hidden columns you want to display.

   Separate cell or range references with commas.
3. Click the OK button.

   Microsoft Excel selects the cells in the hidden columns.
4. Choose Format Column Width.
5. Type a number greater than zero, or turn on the Standard Width check box.
6. Click the OK button.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Adjusting, adding, or deleting rows in a worksheet	Row
Column or row headings and titles	Display options
Moving worksheet cells and ranges	Moving data on a worksheet
Copying worksheet cells and ranges	Copying data and formats

Command, menu, and dialog box

A **command** is a word or phrase that instructs Microsoft Excel to carry out an action. Microsoft Excel's commands are on **menus** with related commands grouped together. Command names followed by ellipses (. . .) display a **dialog box** when you choose them, so you can enter more information or select options before carrying out the command.

This topic explains:

- Working with commands and menus

  Choosing a command from a menu
  Displaying short menus or full menus
  Choosing a shifted command
  Grayed commands

- Working in dialog boxes

  The parts of a dialog box
  Using the mouse in a dialog box
  Using the keyboard in a dialog box
  Grayed dialog box options

Note Throughout the *Microsoft Excel Reference* and in all other print and online materials in the Microsoft Excel package, a command is usually referred to by both its menu name and actual command name. For example, "File Open command" refers to the Open command on the File menu. This naming convention reflects the sequence you follow in choosing a command — first selecting the menu, then choosing the command.

Working with Commands and Menus

Microsoft Excel commands are grouped on menus whose names appear in the menu bar in the Microsoft Excel window. Depending on what kind of window is active, the menu bar displays a different set of menu names:

- Worksheet or macro sheet window — worksheet menu names displayed.
- Chart window — chart menu names displayed.
- Info window — Info menu names displayed.

For more information on menu bars in Microsoft Excel, see **Menu and menu bar.**

For more information on menu bars in Microsoft Excel, see **Menu and menu bar.**

Worksheet Menus

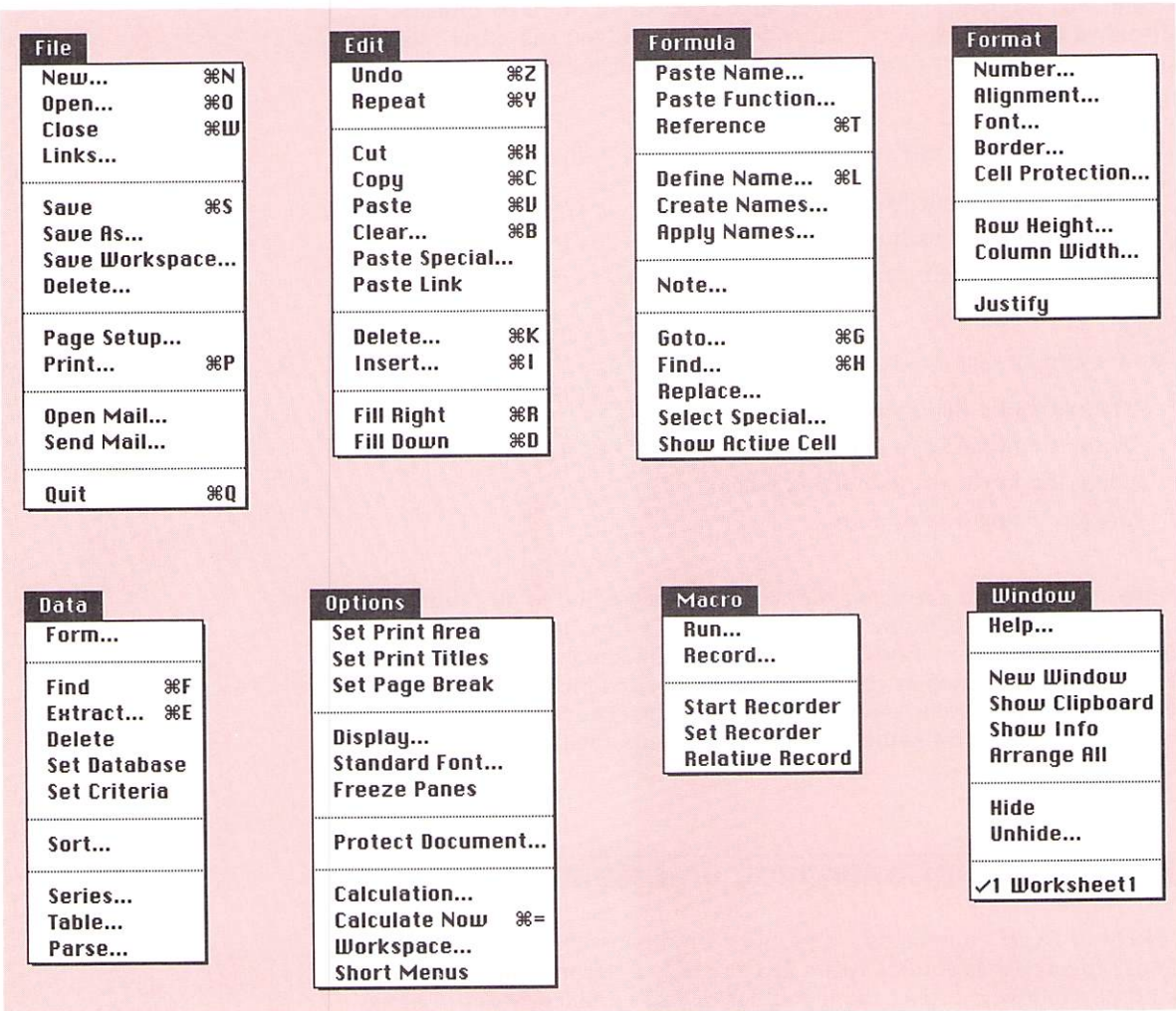
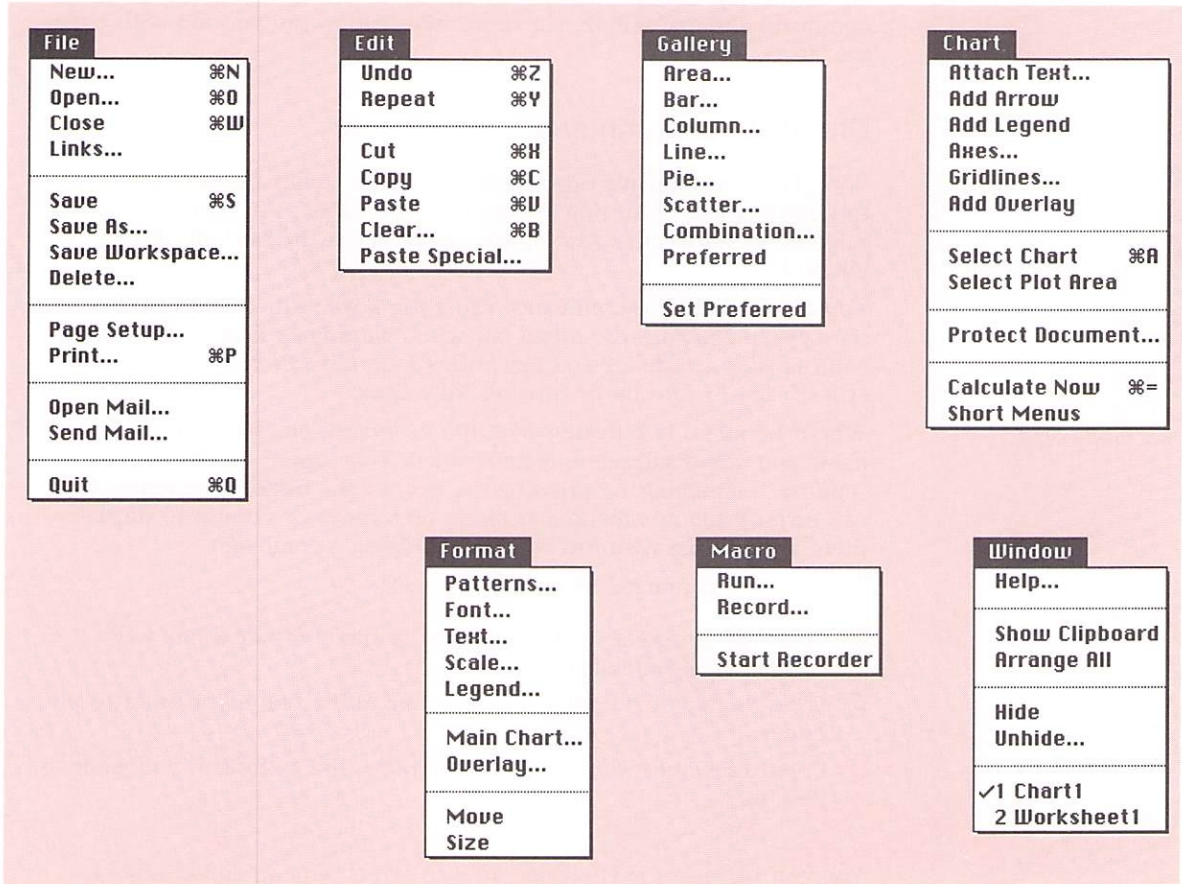
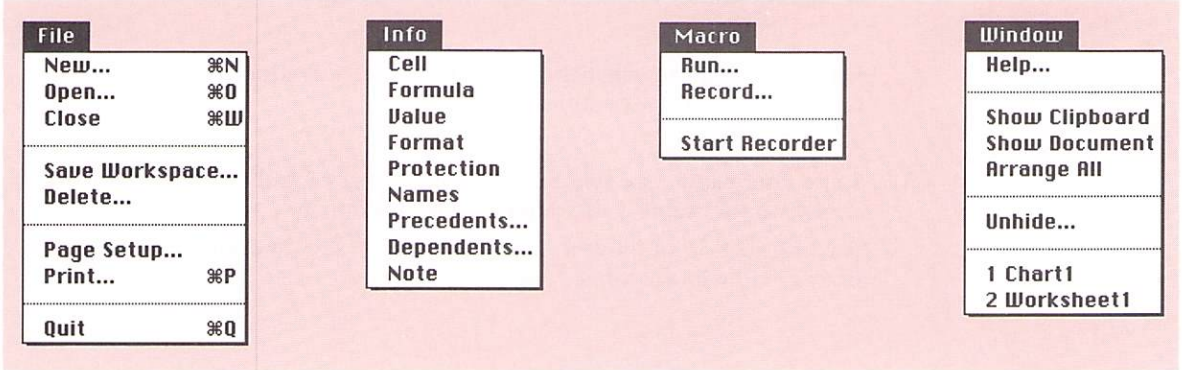


Chart Menus



Info Menus



Tip You can take a complete "guided tour" of the commands through Microsoft Excel Help. Help provides complete information on each command and dialog box. For more information on working with Help, see **Help.**

Choosing a Command from a Menu

You choose commands from Microsoft Excel menus using the mouse the same as you do in other Macintosh programs. A description of the selected menu item appears in the status bar at the bottom of the window.

You can also choose commands using the keyboard. The period key on the keypad activates the menu bar when Num Lock is not on. (When Num Lock is on, the period key enters a period.) Press the Num Lock (Clear) key to turn on or turn off Num Lock.

When the menu is activated with the keyboard, one letter of every menu name and command name is underlined. You "open" menus and "choose" commands by pressing the key for the underlined letter. You can turn off the command and menu underlines or choose to display them all the time with the Options Workspace command.

To choose a command using the keyboard:

1. Press the period key on the keypad or the alternate menu key (assigned to / initially).
2. Press the key for the underlined letter of the menu you want to pull down.
3. Press the key for the underlined letter of the command you want to choose.

You can also use the Direction keys to select a menu and choose a command after you activate the menu bar. Press Enter to choose the highlighted menu or command. To cancel command selection with the keyboard, press Command+. (period) or Escape.

Note You can reassign the alternate menu activation key with the Options Workspace command.

Some commands can also be executed by pressing the key combination shown to the right of the command on the menu.

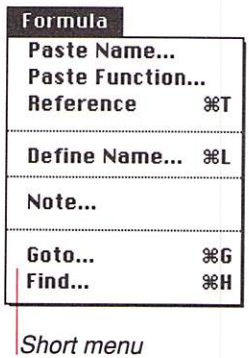
For information on how to use a dialog box, see "Working in Dialog Boxes," later in this topic.

Displaying Short Menus or Full Menus

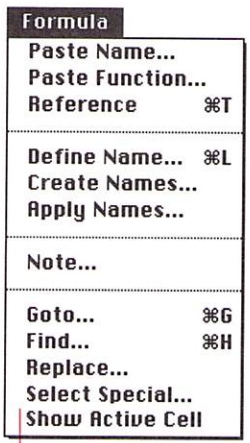
You can choose whether you want to display short menus or full menus:

- **Short Menus** display the most common commands you use for routine worksheet, database, and chart tasks. Using short menus makes it easy to learn the basic commands so that you can become productive quickly. When you start Microsoft Excel the first time, Short Menus are displayed.
- **Full Menus** contain all the commands on short menus, plus commands for more advanced or specialized tasks.

For example, here's how the Formula menu looks displayed as a Short Menu and a Full Menu:



Short menu



Full menu

To use a command on a Full Menu, you must first switch to Full Menus.

To switch to Full Menus from Short Menus:

- Choose Options Full Menus, or Chart Full Menus if the active document is a chart.

To switch to Short Menus from Full Menus:

- Choose Options Short Menus, or Chart Short Menus if the active document is a chart.

Choosing a Shifted Command

Microsoft Excel has a small number of shifted commands — variations of commands normally displayed on a few worksheet and chart menus. When you hold down Shift while selecting a menu, Microsoft Excel displays the shifted command names.

The following table lists commands that have shifted versions:

Regular Command	Shifted Command
File Close	File Close All
Edit Copy	Edit Copy Picture
Edit Fill Right	Edit Fill Left
Edit Fill Down	Edit Fill Up
Options Calculate Now Calculate Document command	Options Calculate Document

For information on each shifted command, see the topic by that name.

Grayed Commands

Some commands occasionally appear grayed or dimmed. This indicates that the command is not available at this time and that you may need to make a selection or complete an action before choosing the command. Most commands are grayed while the formula bar is active.

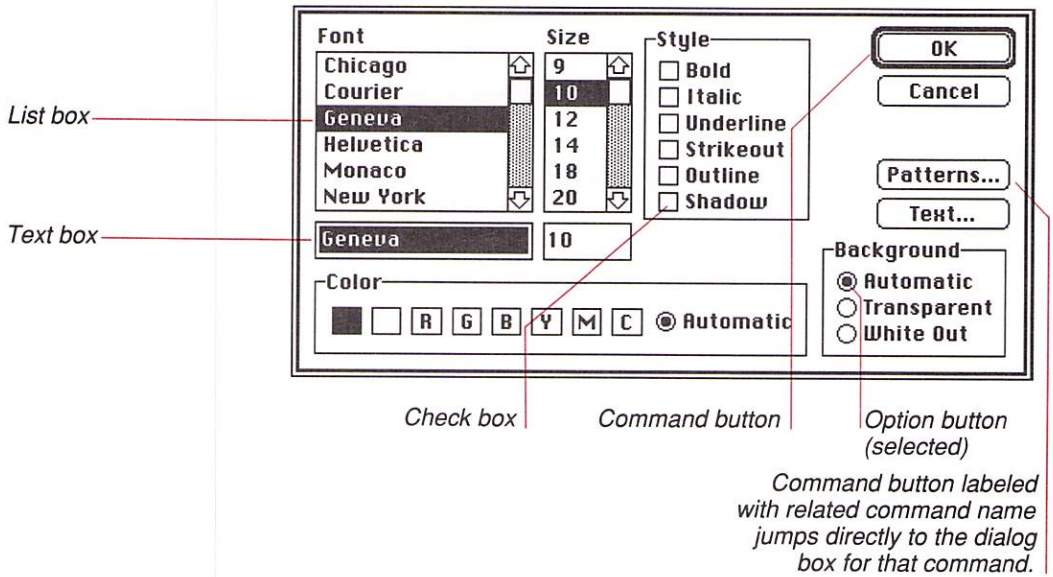
Working in Dialog Boxes

Microsoft Excel displays a **dialog box** when it needs additional information to carry out a command or action. A command name followed by an ellipsis (. . .) on a menu indicates that Microsoft Excel displays a dialog box after you choose that command.

The Parts of a Dialog Box

A dialog box may include areas in which you enter text or numbers and view or change settings for options related to the command. Or it may simply display additional information or a request for confirmation.

The dialog box for the Format Font (charts) command shows most of the elements found in dialog boxes:



List box — a boxed area that displays a list of choices.

Text box — a rectangular box in which you can type an option or name (text or numbers).

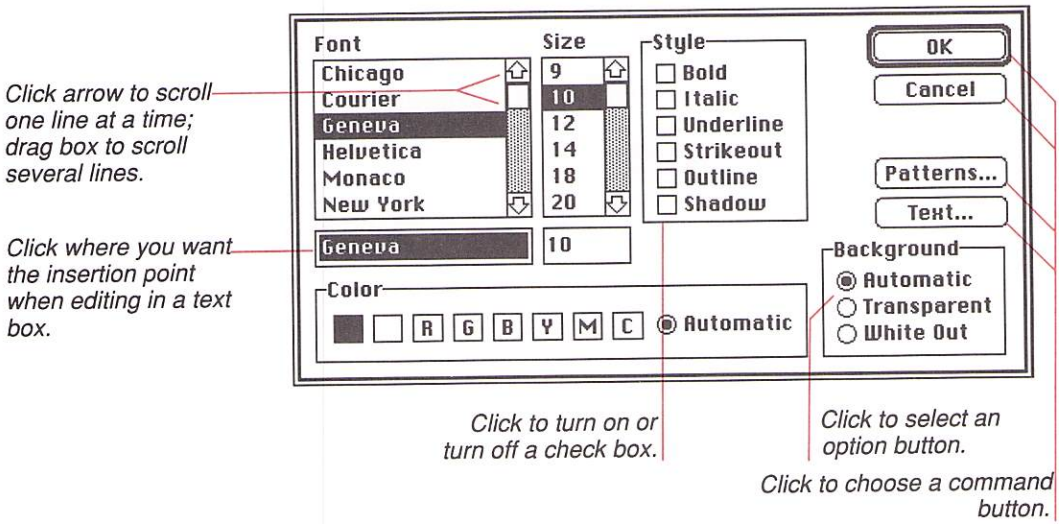
Option button — a small round button used to select an option. Only one option button at a time can be selected within a group.

Check box — a small square box used to turn an option on or off. More than one check box option can be turned on.

Command button — a large rectangular button, labeled to indicate the action it carries out. The OK button closes the dialog box and carries out the command. The Cancel button closes the dialog box and cancels the command. A command button may also be labeled with other actions or the names of other commands. If you click a button labeled with a command name, the dialog box for that command is displayed.

Using the Mouse in a Dialog Box

The following illustration shows how to use the mouse to move and click options and buttons, turn check boxes on or off, and choose commands in a dialog box:

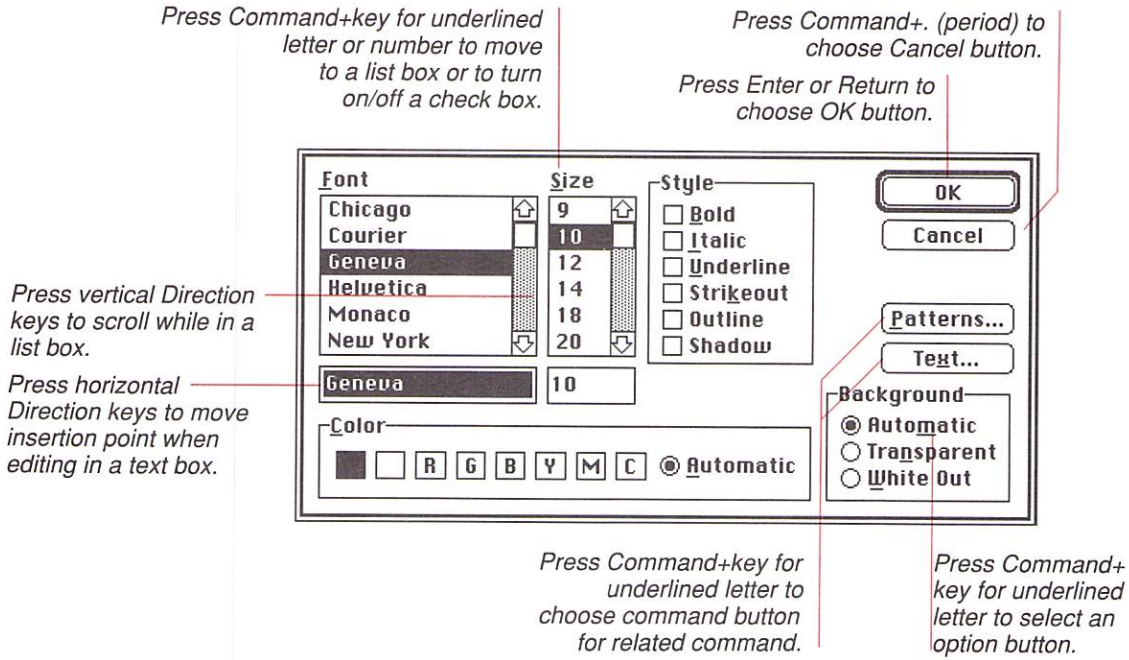


You can also use the following techniques while working with the mouse in a dialog box:

- Double-click a list box item or an option button to carry out the command.
- Click the check box label to turn it on or off, or click the option button label to select it.

Using the Keyboard in a Dialog Box

The following illustration shows how to use the keyboard to move and select in a dialog box:



You can also move and select in a dialog box, using these keys:

- Press Tab to move to the next list box, text box, check box, command button, or group of option buttons.
- Press Backspace to delete characters in a text box.
- Use the Left or Right Arrow keys to scroll text that extends beyond the border of a text box.

Grayed Dialog Box Options

Some dialog box options occasionally appear grayed. This indicates that the option is not available at this time and that you may need to make a selection or complete an action before specifying the option.

Note A check box may appear shaded if an option is already in effect for some but not all the cells in a selected range. If you want the option to apply to all cells in the selection, turn on the check box. If you want to cancel the option for all cells in the selection, turn off the check box.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart

You can find information about Microsoft Excel basics in the other core topics: **Chart, Database, Help, Windows,** and **Worksheet.**

Functions and Macros

"Custom Menus and Dialog Boxes" in Chapter 7, "Custom Menus and Dialog Boxes"

Constant value

A **constant value** is anything you enter into a cell, other than a formula. Formulas always begin with an equal sign (=).

Constant values may be text, numbers (including dates and times), logical values, or error values. Note that logical values and error values are normally displayed in a cell as the result of a formula and are therefore not constants. However, if the values themselves are entered into cells instead of formulas — for instance, if you choose Edit Paste Special and paste values only — the values are then constants. Microsoft Excel never changes constant values as part of its calculations. Values that appear in a cell as the result of that cell's formula are not constant values.

For more information, see **Values, Number, Text, Date,** and **Time.**

Convergence

During **iteration** — a process of automatically repeating calculations to resolve circular references — **convergence** occurs when the difference between results from one calculation to the next becomes smaller and smaller. When this happens, Microsoft Excel continues to iterate until one of the following happens:

- The maximum change between iterations is reached.
- The maximum number of iterations is completed.

You can also press Command+. (period) to cancel iteration.

You specify maximum change and maximum number of iterations in the Options Calculation dialog box. For more information, see **Iteration** and **Divergence.**

Copying data and formats

With Microsoft Excel you can copy data, cell notes, formulas, and formats to simplify editing tasks and streamline worksheet construction. You can copy cells and ranges to a different part of the worksheet or to another worksheet without affecting the original cells. You can also copy chart data and formats into another chart.

This topic explains:

- Copying in a worksheet

  How copying affects relative and mixed references
  How copying affects named cells and ranges
  Copying to another part of the worksheet or to a different worksheet
  Copying the same cells to many areas of a worksheet
  Copying to adjacent cells
  Copying specific cell or range attributes
  Pasting only non-blank cells or transposing copied cells
  Combining the contents of the copy and paste areas
  Copying in the formula bar

- Copying a chart

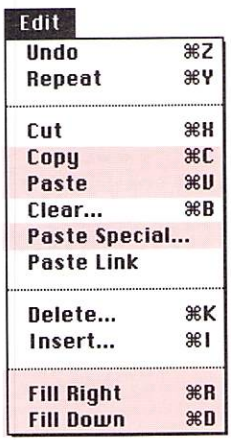
  Copying chart data and formats

This topic does not discuss copying data from a worksheet to a chart or copying data between Microsoft Excel and other applications. For information on these topics, see **Chart data series** and **Exchanging data between applications,** respectively.

Note All concepts and procedures for copying in worksheets also apply to macro sheets.

Copying in a Worksheet

The commands for copying in a worksheet are on the Edit menu (full menus shown):



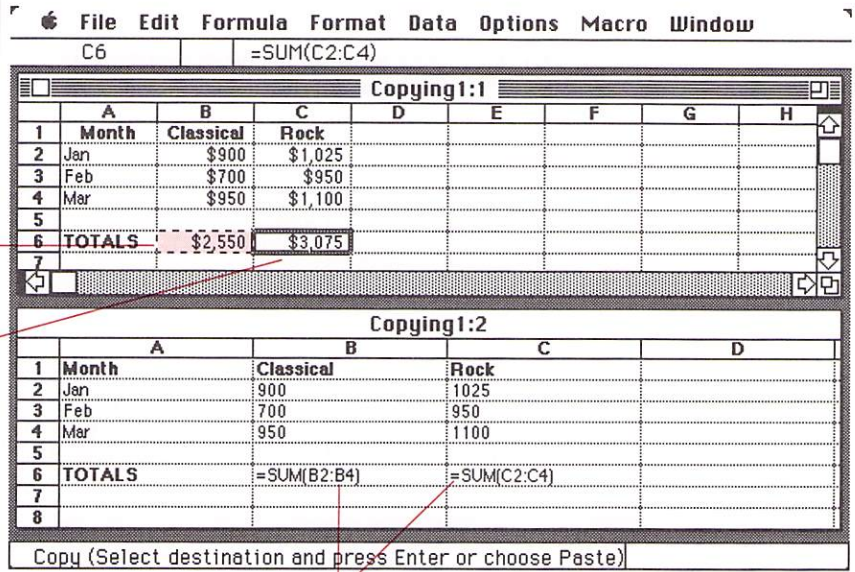
- Edit Copy defines the copy area — the cell or range you want to copy.
- Edit Paste places the cell or range you copy into the paste area — the new location that you specify.
- Edit Paste Special pastes part of a cell or range — for example, formulas only or formats only.
- The Edit Fill commands copy data or formulas into adjacent cells.

For information on each command, see the topic of the same name.

How Copying Affects Relative and Mixed References

When you paste copied cells, Microsoft Excel adjusts the relative references in the pasted cells. Also, the relative parts of mixed references in the pasted cells are changed.

For example, in the following illustration, which uses the A1 reference style, the formula in cell B6 refers to the range of three cells above it. If you copy cell B6 and paste it in cell C6, Microsoft Excel changes the references so that the formula still refers to the three cells in the same relative positions above it. When you copy relative or mixed references in the A1 reference style, the paste area references look different than those in the copy area because Microsoft Excel adjusts them to refer to different cells that are in the same relative positions.



Cell B6, the copied cell, refers to cells B2:B4.

When the copied cell (B6) is pasted into cell C6, Microsoft Excel adjusts the references to refer to cells C2:C4.

The bottom window shows the formula view of the worksheet in the top window. Compare the formulas in the copied cell (B6) and the cell copied to (C6).

Microsoft Excel makes the same type of adjustments when you use the R1C1 reference style. For example, using the R1C1 reference style in the preceding illustration, the formula in cell R6C2 (cell B6 in the illustration) would be

=SUM(R[−4]C:R[−2]C)

If you copy cell R6C2 to cell R6C3 (cell C6 in the illustration), Microsoft Excel does not change the references; they still refer to the "second through fourth cells up from the formula cell." The [−4] and [−2] in R[−4] and R[−2] indicate the relativity of the references. Thus, when you copy relative or mixed references in R1C1 style, the paste area references look the same as those in the copy area, even though they refer to different cells.

Important If you need to create a formula with references that will refer to the same cells after you copy them, use absolute references in the formula. Enter A1 style references with $ symbols (for example, $A$1) and enter R1C1 style references without brackets around the row and column numbers (as in, R6C2).

For information on absolute, relative, and mixed references, see **References.**

How Copying Affects Named Cells and Ranges

You can copy references to named cells and ranges between worksheets. Microsoft Excel keeps track of names used on worksheets and alerts you if you use duplicate names when copying between worksheets.

If a copied formula from one worksheet contains a name that is already defined on the worksheet in which you are pasting the formula, Microsoft Excel displays a message asking if you want to use the existing definition of the name. Click Yes to use the definition on the active worksheet — the worksheet in which you are pasting the formula. Click No to use the definition on the worksheet you are copying the formula from. If you click No, Microsoft Excel asks you to create a different name for the definition.

For example, you might have a worksheet named 1986, with the name Inflation defined on it as 4%, and a worksheet named 1980, where the name Inflation is defined as 15%. If you copy a formula containing a reference to Inflation from the 1980 worksheet to the 1986 worksheet, Microsoft Excel asks if you want to use the existing definition of Inflation in the 1986 worksheet. If you click Yes, the formula uses the 4% inflation rate for calculations. If you click No, the formula uses the 15% inflation rate, but Microsoft Excel asks you to rename it because Inflation cannot be defined as 4% and 15% at the same time.

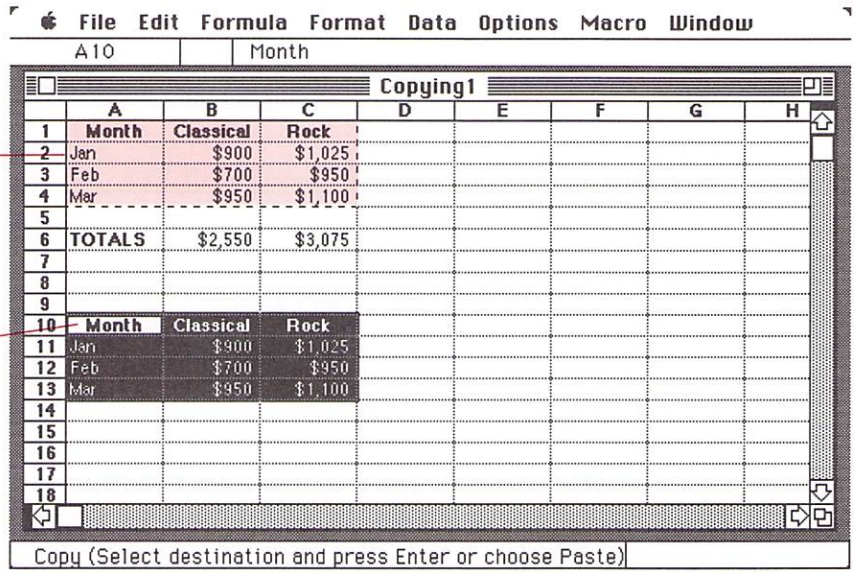
For more information on using named cells and ranges, see **Names.**

Copying to Another Part of the Worksheet or to a Different Worksheet

Whether you are copying to another part of the worksheet or to a different worksheet, the procedure is basically the same. When you select cells and choose the Edit Copy command, Microsoft Excel surrounds the copy area with a dotted line, called the **marquee.** The easiest way to select the paste area for copied cells is to select only the upper-left cell of the range you want to copy to. If you select the entire paste area, it must be the same size and shape as your copy area.

Select a cell or range—and choose Edit Copy to mark it as the copy area. The marquee (dotted line) surrounds the copy area.

Select the upper-left cell of the paste area (or a paste area the same size as the copy area); choose Edit Paste to complete the copy.


File Edit Formula Format Data Options Macro Window
A10
Month
Copying1
Copy (Select destination and press Enter or choose Paste)

	A	B	C	D	E	F	G	H
1	Month	Classical	Rock					
2	Jan	$900	$1,025					
3	Feb	$700	$950					
4	Mar	$950	$1,100					
5								
6	TOTALS	$2,550	$3,075					
7								
8								
9								
10	Month	Classical	Rock					
11	Jan	$900	$1,025					
12	Feb	$700	$950					
13	Mar	$950	$1,100					
14								
15								
16								
17								
18								

Note If the upper-left corner of the paste area is selected and the copy area exceeds the area available for pasting, Microsoft Excel displays a message and does not paste the copied range.

To copy cells:

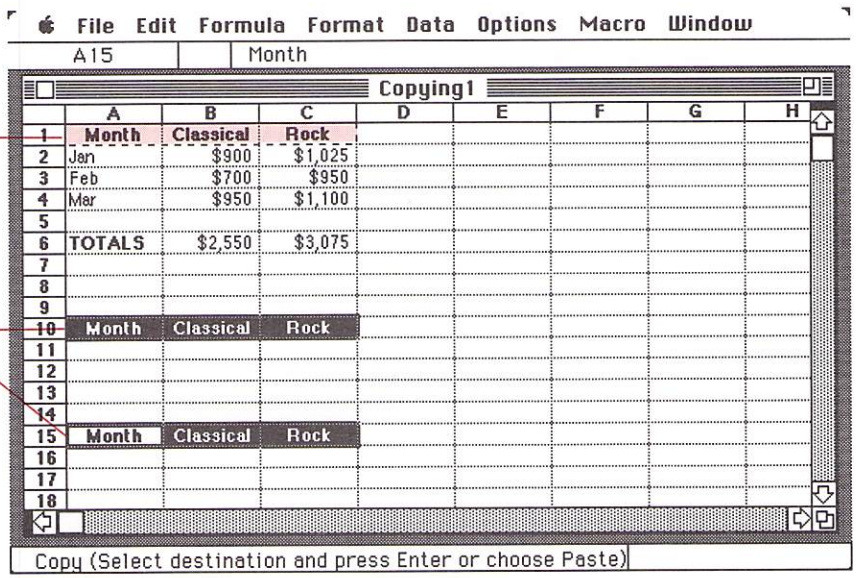
1. Select the cells you want to copy.
2. Choose Edit Copy.
   Microsoft Excel surrounds your selection with the marquee.
3. Select the paste area — the cells you want to copy to or the cell in the upper-left corner of the area.
4. Choose Edit Paste or press Enter.
   Microsoft Excel fills the paste area with the copied cells.

Copying the Same Cells to Many Areas of a Worksheet

You can copy the same cell or range to many areas of a worksheet. To do this, you make a multiple selection for the paste area.

The copy area is marked with dotted marquee.

The paste area is a multiple selection, each part of the selection is the same shape as the copy area.


File Edit Formula Format Data Options Macro Window
A15
Month
Copying1
Copy (Select destination and press Enter or choose Paste)

	A	B	C	D	E	F	G	H
1	Month	Classical	Rock					
2	Jan	$900	$1,025					
3	Feb	$700	$950					
4	Mar	$950	$1,100					
5								
6	TOTALS	$2,550	$3,075					
7								
8								
9								
10	Month	Classical	Rock					
11								
12								
13								
14								
15	Month	Classical	Rock					
16								
17								
18								

You can also duplicate the copy area many times within one paste area. To do this, you select a paste area made up of multiple rectangles the same shape as the copy area. In the preceding illustration, for example, selecting cells A10:C17 for the paste area would paste in the copied range eight times.

To copy the same cells to many areas of a worksheet:

1. Select the cells you want to copy.
2. Choose Edit Copy.

3 To paste the same cells in many areas of the worksheet, select multiple paste areas the same size and shape as the copy area.

To duplicate the copy area many times within one paste area, select a paste area made up of multiple rectangles of the same size and shape as the copy area.

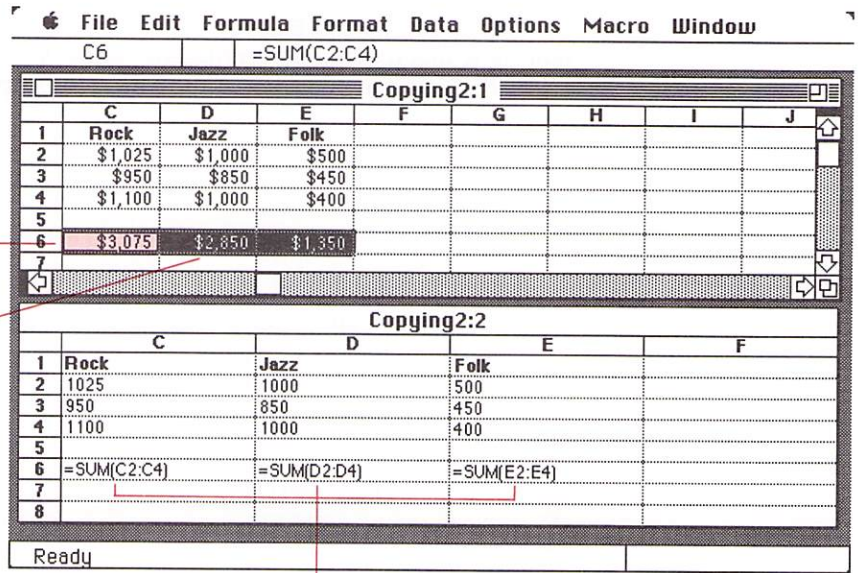
4 Choose Edit Paste or press Enter.

Note To make a multiple selection, drag through the first selection, then hold down the Command key as you drag through each additional selection.

Copying to Adjacent Cells

If you need to put the same formulas or data in several adjacent worksheet cells, you can enter the information once, and then copy it. The Edit Fill commands allow you to copy cells from one or more cells in a selection into the adjacent cells of the selection.

The following illustration shows how you could use one formula for several data entry areas:



Cell C6, the copied cell, refers to cells C2:C4.

Cell C6 is copied to cells D6 and E6 with the Edit Fill Right command.

The bottom window shows the formula view of the worksheet in the top window. Compare the formulas in cells C6, D6, and E6 to see how Microsoft Excel adjusted the references.

To copy to adjacent cells:

1. Select the cell(s) you want to copy and the cells you want to fill.
2. To copy the selection's first column into the adjacent cells to the right, choose Edit Fill Right.

   To copy the selection's first row to the adjacent cells below, choose Edit Fill Down.

   To copy the selection's last column into the adjacent cells to the left, choose Edit Fill Left (hold down Shift and select the Edit menu).

   To copy the selection's last row into the adjacent cells above, choose Edit Fill Up (hold down Shift and select the Edit menu).

Tip When the formula bar is active, you can enter the same formula or value into all of the selected cells by holding down the Option key while you press Enter or click the enter box in the formula bar. Microsoft Excel fills each cell in the selection with the formula or value. For more information on using the formula bar, see **Formula bar.**

Copying Specific Cell or Range Attributes (Full Menus)

Use the Edit Copy and Edit Paste Special commands when you want to limit how much of a cell or range you copy. With Edit Paste Special, you can specify that any or all of the following be copied:

- Formulas
- Values
- Formats
- Notes

To copy specific cell or range attributes:

1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. In the Paste box, click the option you want.
6. Click the OK button.

For information on the Edit Paste Special options, see **Edit Paste Special command.**

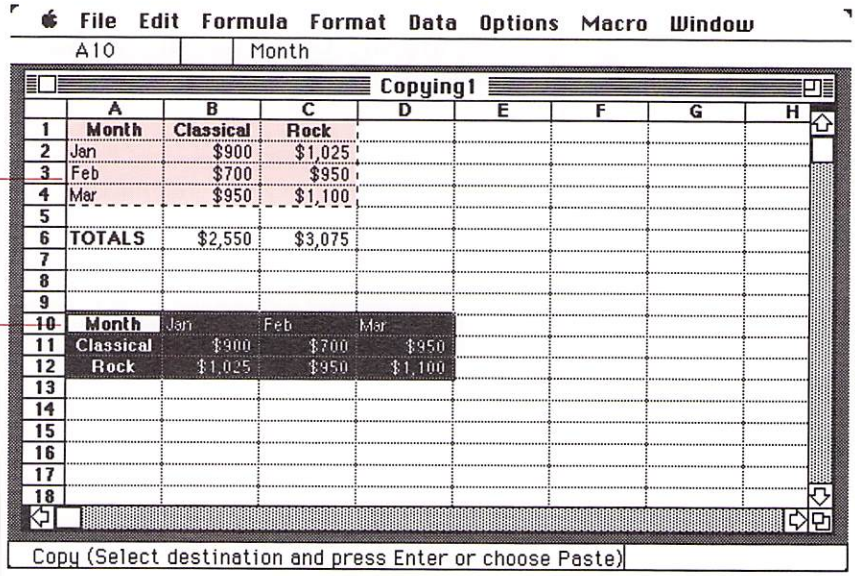
Pasting Only Non-Blank Cells or Transposing Copied Cells
(Full Menus)

With the Edit Paste Special command, you can specify that only non-blank cells from the copy area be included in the paste area. Cells in the paste area corresponding to blank cells in the copy area are unaffected by the paste.

With the Edit Paste Special command, you can also specify that the copied cells be transposed in the paste area. This means that if the copied data is originally arranged in columns, Microsoft Excel will paste the data in rows, as in the following illustration:

Choose Edit Copy to mark the selected cell or range as the copy area.

Select the paste area and choose Edit Paste Special. Turn on the Transpose check box to reverse the arrangement of data in the paste area.


File Edit Formula Format Data Options Macro Window
A10
Month
Copying1
Copy (Select destination and press Enter or choose Paste)

	A	B	C	D	E	F	G	H
1	Month	Classical	Rock					
2	Jan	$900	$1,025					
3	Feb	$700	$950					
4	Mar	$950	$1,100					
5								
6	TOTALS	$2,550	$3,075					
7								
8								
9								
10	Month	Jan	Feb	Mar				
11	Classical	$900	$700	$950				
12	Rock	$1,025	$950	$1,100				
13								
14								
15								
16								
17								
18								

To paste only non-blank cells or to transpose the copied cells in the paste area:

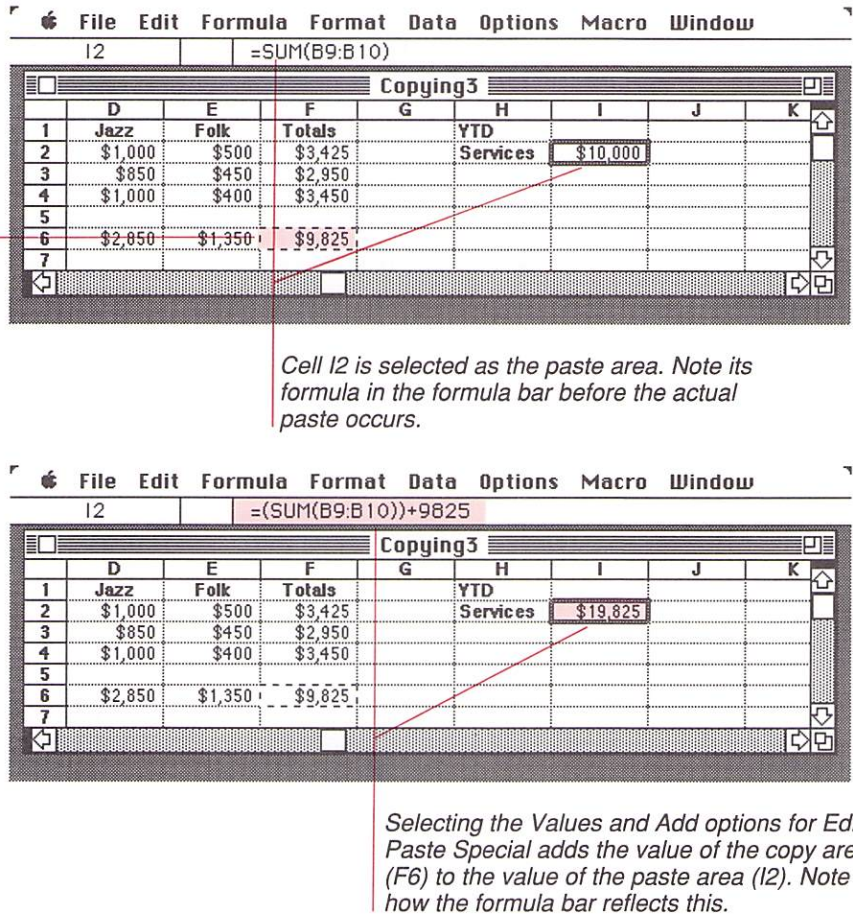
1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. To paste only non-blank cells from the copy area, turn on the Skip Blanks check box.

   To switch the arrangement of the copied cells in the paste area, turn on the Transpose check box.
6. Click the OK button.

Combining the Contents of the Copy and Paste Areas
(Full Menus)

With the Edit Paste Special command, you can specify that the contents in the copy and paste areas be combined by adding, subtracting, multiplying, or dividing them when you paste.

Use this procedure to formulate cumulative data, as in the following illustration:


File Edit Formula Format Data Options Macro Window
I2
=SUM(B9:B10)
Copying3
D E F G H I J K
1 Jazz Folk Totals YTD
2 $1,000 $500 $3,425 Services $10,000
3 $850 $450 $2,950
4 $1,000 $400 $3,450
5
6 $2,850 $1,350 $9,825
7
Cell F6 is selected as the copy area.
Cell I2 is selected as the paste area. Note its formula in the formula bar before the actual paste occurs.
File Edit Formula Format Data Options Macro Window
I2
=(SUM(B9:B10))+9825
Copying3
D E F G H I J K
1 Jazz Folk Totals YTD
2 $1,000 $500 $3,425 Services $19,825
3 $850 $450 $2,950
4 $1,000 $400 $3,450
5
6 $2,850 $1,350 $9,825
7
Selecting the Values and Add options for Edit Paste Special adds the value of the copy area (F6) to the value of the paste area (I2). Note how the formula bar reflects this.

To combine the contents of the copy and paste areas:

1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. In the Paste box, click the Values option.
6. In the Operation box, click the option you want.
7. Click the OK button.

Note When consolidating data from more than one worksheet, you can also use the procedures for linking cells or ranges between worksheets. For information on linking, see **Linking documents.**

Copying in the Formula Bar

As a time-saver when you're creating long formulas or labels, use the Edit Copy and Edit Paste commands while working in the formula bar.

To copy characters in the formula bar

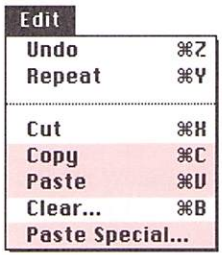
1. In the formula bar, select the characters you want to copy.
2. Choose Edit Copy.
3. Move the insertion point in the formula bar to where you want to paste the copied characters.
4. Choose Edit Paste.

To copy all or part of another cell entry into the formula bar

1. Select the cell, and in the formula bar, select the characters you want to copy.
2. Choose Edit Copy.
3. Click the Cancel box or press Command+. (period) to deactivate the formula bar.
4. Select the cell you want to copy to.
5. Move the insertion point in the formula bar to where you want to paste the copied characters.
6. Choose Edit Paste.

Copying a Chart

The main commands for copying in a chart are also on the Edit menu (full menus shown):



- You use the Edit Copy, Edit Paste, and Edit Paste Special commands to copy data series or chart formats to another chart.

For information on each command, see **Edit Copy command, Edit Paste command,** and **Edit Paste Special command.**

Copying Chart Data and Formats

When you copy data from one chart to another, Microsoft Excel combines the data from the copied chart with the data in the chart you copy to. When you copy formats, the copied formats replace the formats in the chart you copy to.

There are two ways to copy data and formats from one chart to another:

- Use the Edit Paste command to paste all data and formats from one chart into another.
- Use the Edit Paste Special command to paste either data or formats from one chart to another.

Important When you use the Edit Paste command to copy from one chart to another, Microsoft Excel replaces the formats of the active chart with those of the copied chart. Use the Edit Paste Special command to copy only data from one chart to another.

To copy all data and formats to another chart

1. Make sure both chart documents are open.
2. Activate the chart window for the chart you want to copy.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window for the chart to which you want to copy.
6. Choose Edit Paste or press Enter.

To copy data and/or formats to another chart (full menus)

1. Make sure both chart documents are open.
2. Activate the chart window for the chart from which you want to copy.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window for the chart to which you want to copy.
6. Choose Edit Paste Special.
7. Click the option for the item you want pasted.

   To copy only data and no formats, click the Formulas option.
8. Click the OK button.

Related Information

Reference

For information on	See
Moving data	Moving data on a worksheet
Editing worksheets and charts	Editing a document
Creating and editing data series in a chart	Chart data series Series formula

Data Delete command

(Full Menus)

Deletes records from the database. Data Delete deletes all records that match the criteria defined in the criteria range.

When you delete records from the database, the other records in the database shift up to fill any gaps, but the rest of the worksheet is not affected.

For example, if you delete 10 records from a database, the remaining records in the database shift up to fill the gaps, but the cells below the database do not shift up 10 rows, as they would if you used the Edit Delete command.

Important Data Delete cannot be reversed with the Edit Undo command. Before you click the OK button, make sure that you want to delete all of the records that match the criteria in your criteria range. You may want to use the Data Find or Data Extract command to preview the records that Data Delete will delete.

Important When you choose Data Delete, make sure you don't unintentionally include any blank rows in the criteria range. With a blank row in the criteria range, Microsoft Excel matches every record in the database; therefore, all records in the database would be deleted.

You may want to use the File Save command to save the worksheet before you use Data Delete. If you inadvertently delete records you didn't want to delete, you can close the worksheet without saving the changes, then re-open the saved version with File Open.

Data Exit Find command

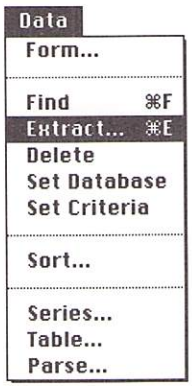
In a database, exits Data Find and returns the scroll bars to normal scrolling.

Exit Find appears on the Data menu only when you are in Data Find. You can also exit Data Find by editing the formula or value of a cell, selecting a cell outside the database range, choosing another command, or pressing Command+. (period). The matching record stays selected when you exit Data Find.

If you choose the Data Find command again, Microsoft Excel selects the next record that matches the criteria in the criteria range, and Exit Find reappears on the Data menu. When Microsoft Excel reaches the last matching record in the database, it displays a message. For more information on finding database records, see **Data Find command** and **Database.**

Data Extract command

(Full Menus)



Finds database records that match the criteria defined in the criteria range, and copies them into a separate extract range.

Note To extract data, you need to have three ranges defined:

- The database range (use the Data Set Database command)
- The criteria range (use the Data Set Criteria command)
- The extract range

The extract range can be either a one-row range containing only field names, or a multiple-row range containing field names and the rows into which you want to copy the extracted data.

If you select an extract range that contains only the field names, Microsoft Excel copies the extracted records into the cells directly below the field names.

Important Any values or formulas below the field names in the extract range are replaced with the extracted information. If the extract range contains only the field names, *all* cells below the field names to the bottom of the worksheet are cleared whether or not information is extracted into them. You cannot reverse Data Extract with the Edit Undo command.

If you select an extract range containing the field names and cells below the field names, Microsoft Excel copies only as many extracted records as will fit into the selected range. If there are more matching records than will fit in the extract range, a message appears on the screen to tell you that the extract range is full. If this happens, either make the extract range larger and extract again, or include only the extract field names in the extract range.

The field names you use for the extract range must be the same as the field names you used in the database. However, you don't have to use all of the database field names in the extract range. Use only the field names for the fields from which you want information copied into the extract range.

After selecting the extract range, choose Data Extract.

Unique Records Only Excludes duplicates from the extracted list.

Note If a record contains a formula, the extract range will contain only the value produced by that formula and not the formula itself.

Data Find command

Selects records in the database range that match the criteria in the criteria range.

When you choose Data Find, Microsoft Excel selects the first matching record in the database and the scroll boxes become striped. When you scroll, Microsoft Excel selects only matching records in the database.

To search backward in the database, hold down Shift when you choose Data Find.

When you are using Data Find, the Exit Find command appears on the Data menu. You exit Data Find by choosing Data Exit Find, editing the formula or value of a cell, selecting a cell outside the database range, choosing another command, or pressing Command+. (period).

When you exit Data Find, the matching record you last found stays selected.

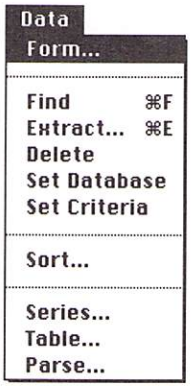
If you choose Data Find again, Microsoft Excel selects the next matching record. This means that you can find and replace matching database records by choosing Data Find to find the next matching record after each edit.

For information on finding and replacing data on the entire worksheet, rather than just in the database, see **Formula Find command, Formula Replace command,** and **Finding cells and data quickly.**

When Microsoft Excel reaches the last matching record in the database, it remains at that record. You can return to the beginning of the database by dragging the scroll box to the top of the scroll bar.

For more information on finding records, see **Database.**

Data Form command



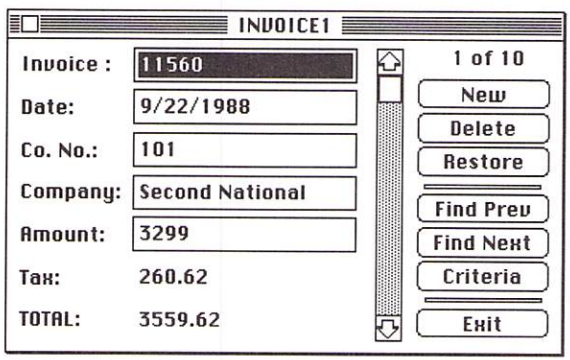
Displays a dialog box arranged as a database form. When you want to work with a database, Data Form provides an alternative to the database commands on the Data menu. Data Form lets you view, change, add, and delete records in your database, and find specific records based on the criteria you specify while the form is displayed.

Data Form works independently of the other database commands (Data Find, Data Delete, and Data Extract). Data Form also operates independently of the criteria range, and if you use criteria within the form to find specific database records, those criteria do not affect the criteria specified in the criteria range on the worksheet.

Note You can also customize the form that appears when you choose Data Form. If the name Data_Form is defined on the worksheet, and it refers to a valid custom dialog box description on a worksheet or a macro sheet, the custom form appears instead of the standard form when you choose Data Form.

If you use a custom dialog box to create a custom data form, the custom form replaces the part of the data form to the left of the scroll bar. The scroll bar and the buttons to the right of the scroll bar are added automatically.

For information on custom dialog boxes, databases, and using the data form, see **Database.**



Field Names The column of text at the left side of the form is a list of your database's field names.

Fields The column next to the field names contains the fields that correspond to those field names. These fields collectively make up a single database record.

Fields that you can edit in the data form appear in a text box, which you edit the same as any text box. Fields that are computed or protected cannot be edited, so do not appear in a text box. A **protected field** is a field in a cell that is locked while the worksheet is protected.

Note Any changes you make to a record are saved when you move to another record.

For information on computed fields, see **Database.** For information on locking a cell, see the **Format Cell Protection command.** For information on protecting a worksheet, see **Options Protect Document command** and **Protecting or hiding data.**

Scroll Bar The scroll bar shows your position in the database and allows you to scroll through database records using the mouse.

The following list shows how to move to fields and records using the mouse:

To	Do this
Select a field	Click in the text box
Move to the same field in the next record	Click the down scroll arrow
Move to the same field in the previous record	Click the up scroll arrow
Move to the same field 10 records forward	Click the scroll bar below the scroll box
Move to the same field 10 records back	Click the scroll bar above the scroll box
Move to the new record at the end of database	Drag the scroll box to the bottom
Move to the first record	Drag the scroll box to the top

The following list shows how to move to fields and records using the keyboard:

To	Press
Move to the next field in the record	Tab
Move to the previous field in the record	Shift + Tab
Move to the first field in the next record	Enter
Move to the first field of the previous record	Shift + Enter
Move to the same field in the next record	Down Arrow key
Move to the same field in the previous record	Up Arrow key
Move to the same field 10 records forward	Page Down
Move to the same field 10 records back	Page Up
Move to the new record at the end of database	Control + Page Down
Move to the first record	Control + Page Up

Position Indicator Shows which record is displayed and how many records are in the database. Blank records at the end of the database are not counted. The position indicator changes to "New Record" when you scroll to the first blank record after the last non-blank record in the database.

New Scrolls to the new record — the first blank record at the end of the database. You can add data to the fields in this record.

If there are no blank records at the end of the database, and there is room below the database, Microsoft Excel extends the database range to include a new, blank record at the bottom of the database.

When you scroll to the new record, the position indicator displays "New Record."

Delete Deletes the data in the currently displayed database record, and moves the other records up to fill the space. Deleting a record does not change the size of the database range, nor the total number of records; it just removes the data from one of the records.

Restore Restores the edited fields of a record to what they were before you made the changes. When you make changes to the fields in a record and then decide not to keep those changes, click the Restore button before you scroll or make any further changes.

Find Prev Searches the database for the previous record that matches the criteria you define with the Criteria button, and displays the fields of that record in the form. If the criteria are blank, Find Prev is the same as pressing Shift + Enter; Microsoft Excel selects the previous record in the database.

Find Next Searches the database for the next record that matches the criteria you define with the Criteria button, and displays the fields of that record in the form. If the criteria are blank, Find Next is the same as pressing Enter; Microsoft Excel selects the next record in the database.

Criteria Allows you to define criteria used when you click the Find Next or Find Prev button. Criteria you define while the data form is displayed are separate from criteria defined with the Data Set Criteria command. For more information on defining criteria, see **Database.**

Form Appears in place of the Criteria button while you are setting criteria. Form returns you to the regular data form, and displays database records instead of criteria.

Exit Puts away the form.

Data Parse command

(Full Menus)

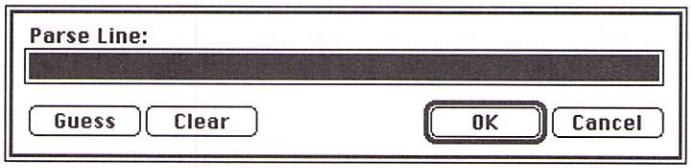
Distributes the contents of a single column to fill several columns. This is called **parsing.**

Data Parse is most often used after you have imported data from other applications into Microsoft Excel.

For example, if you open a database report file from another application as a worksheet in Microsoft Excel, each full record is typically placed in a single cell. Use Data Parse to place the fields of each record in separate columns.

The range you parse can be any number of rows long, but only one column wide. The parse settings you create for the first cell in the range apply to all cells in the range.

For information on parsing data, see **Values.**



Parse Line Displays the contents of the first non-blank cell in the selected column. The only editing allowed in the parse line is adding and deleting brackets. The brackets you set in the parse line define where the contents of all cells in the selected column will be divided into multiple columns. Add brackets by typing them the same way you add characters in the formula bar.

Guess Makes a best guess at where the brackets should go for the data displayed in the parse line. After you click the Guess button, you can modify the guess by adding or deleting brackets.

Clear Removes all brackets from the parse line so you can start over.

Data Series command

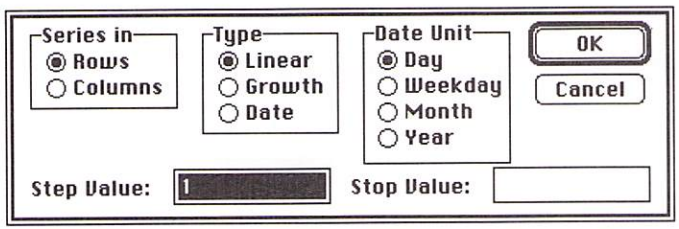
(Full Menus)

Fills the selected range of cells with a series of numbers or dates.

The command fills by rows or columns. The first cell in each row or column to be filled must have the starting value in it.

Select the range of cells you want to fill with a series, then choose Data Series.

Note The series you create with the Data Series command is different from a chart data series. For more information on chart data series, see **Chart data series.**



Series In Determines which direction to fill.

Rows	Fills each row of the selected range with a series that starts with the value in the leftmost cell of the row
Columns	Fills each column of the selected range with a series that starts with the value in the top cell of the column

Type Determines how the value for each cell is calculated from the starting value.

Linear	Adds the Step Value to each cell in turn to calculate the value of the next cell
Growth	Multiplies the value of each cell in turn by the Step Value to calculate the value of the next cell
Date	Calculates a series of dates according to the Date Unit and the Step Value

Date Unit Available only if you select Date as the series type. Select the unit by which you want each successive value in the series of dates to increase.

Step Value Amount by which you want each successive cell in the series to be increased. Type a negative number to make the series decrease.

Stop Value Value at which you want the series to end. Data Series stops filling a series when it reaches the stop value or the end of the selected range, whichever comes first. For dates, the stop value is the last date you want entered.

Data Set Criteria command

Defines the criteria range, which is the range of cells that contains or will contain the criteria used to find, extract, or delete matching database records. Only the database records that meet the criteria in the criteria range are selected by the Data Find command, copied by the Data Extract command, or deleted by the Data Delete command.

A criteria range can have two kinds of criteria: comparison criteria and computed criteria. Each type of criteria is compared to the database records differently, and each has a different criteria name. For more information, see **Database.**

The criteria range must be at least two rows high. For comparison criteria, the first row of the criteria range must contain criteria names that are identical to one or more field names from the database; the criteria go in one or more rows beneath the first row.

To define the criteria range, select the range of cells you want to be the criteria range, then choose Data Set Criteria. Microsoft Excel names the range Criteria. You can use this name just as you use any named reference. Only one criteria range can be defined on a worksheet at a time.

The criteria range can be on a different worksheet than the database. To use a criteria range that is on another worksheet, use the Formula Define Name command to make the name Criteria an external reference. For information on external references, see **References.**

Note If the criteria range contains a blank row, all database records will be matched.

Once you have defined a criteria range, you can change the criteria as often as you want. Each time you find, extract, or delete data, Microsoft Excel uses only the criteria currently in the criteria range.

You can include wildcards when you set criteria. A question mark (?) takes the place of a single character, and the asterisk (*) takes the place of any number of characters. For more information, see **Wildcard.**

For more information on databases and criteria, see **Database.**

Data Set Database command

Defines the range of cells that contains or will contain the database.

A database consists of one row with field names and the rows below it containing the records.

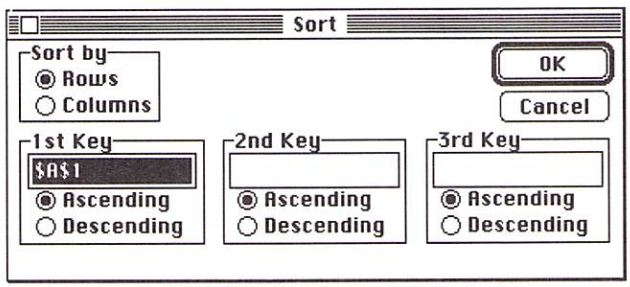
To define a database, select the range of cells you want as your database, including the field names, then choose Data Set Database. Microsoft Excel defines the range as the database range and names the selection Database. You can use this name just as you use any named reference.

For more information, see **Database.**

Data Sort command

Sorts the rows or columns of the selection according to the contents of a key row or column within the selection.

You tell Microsoft Excel which rows or columns to sort, which is the key row or column, and whether to sort in ascending or descending order. You can select several key rows or columns. If using more than one key, specify the most important key as the first key.



Sort By

Rows	Rearranges the rows in the selected range
Columns	Rearranges the columns in the selected range

Keys Identifies which column to sort by when sorting rows, or which row to sort by when sorting columns. You can accept the proposed cell reference, type a new one, or select one on the worksheet. You can reference any cell in a row or column to identify that row or column as a key to the sort.

Duplicates in the first key row or column are sorted according to the second and third keys, if you have identified them. If you have not identified second and third keys, duplicates in the key row or column are left in the order in which they are found.

For each key, click Ascending or Descending to define the order in which you want the data sorted. In ascending order, Microsoft Excel sorts in the following order, top to bottom for rows and left to right for columns:

- Numbers: negative to positive
- Text: according to the order described below. Microsoft Excel ignores capitalization when sorting text.
- Logical values: FALSE then TRUE
- Error values
- Blanks

Text is sorted in the following order:

Space	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/	0
1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	@	A	B
C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	[	\	]	^	_	`	{	¦	}	~		

The numbers in the text sort order shown above refer to numbers that are typed on the worksheet as text values. Numbers that are typed on the worksheet as number values are sorted before text values.

In descending order, Microsoft Excel reverses the order of everything except blank cells, which are always sorted last.

Sorting with More Than Three Keys

You can sort with more than three key rows or columns by sorting two or more times. When you sort with more than three key rows or columns, keep two rules in mind:

- The most recent sort takes precedence.
- Microsoft Excel retains the previous sort sequence in places where the current sort produces equal items.

If you want Microsoft Excel to take into account more than three key rows or columns, sort the data three keys at a time, starting with the least important group of keys and progressing to the most important group, but listing the most important key first within each group.

For example, if you have five key columns you want to use to sort the rows of a selection, do one sort with the fourth and fifth most important columns selected as the first and second keys. Then do a second sort with the three most important columns selected as the keys.

Note If you sort a database, be careful not to include the field names as part of the selection to be sorted. The field names for a database must always remain in the top row of the database.

For more information, see **Sorting data.**

Data table

A **data table** is a range of cells that shows the results of varying one or two values in one or more formulas.

Once you have created a formula, you may want to perform "what-if" analysis by seeing how changing certain constant values in your formula affects the outcome of the formula. Manually changing the numbers one by one can be time-consuming. Data tables provide a shortcut. You set up the table; then Microsoft Excel does the calculations as one operation.

There are two types of data tables: one-input tables and two-input tables. With a **one-input table** you test different values for one variable and see the effect on one or more formulas. With a **two-input table** you test different values for two variables and see the effect on one formula.

This topic explains:

- Using a one-input table

  Setting up a one-input table
  Creating a one-input table
  Adding formulas to an existing table

- Using a two-input table

  Setting up a two-input table
  Creating a two-input table

- Table formulas
- Editing a table

  Clearing the values in a table
  Adding input values or formulas to a table
  Moving a table
  Deleting a table

Using a One-Input Table

If you want to see how changes in one number affect one or more formulas, use a one-input table. For instance, you could use a one-input table to see how your payments would vary depending on the interest rate of a loan.

Setting Up a One-Input Table

1. In a row (or column), enter the formula(s) that will use the values from the table.

   Each formula must refer to the **input cell**, either directly or by referring to other cells that refer to the input cell. The input cell is the cell in which values will be substituted.

   You can enter as many formulas as you want.

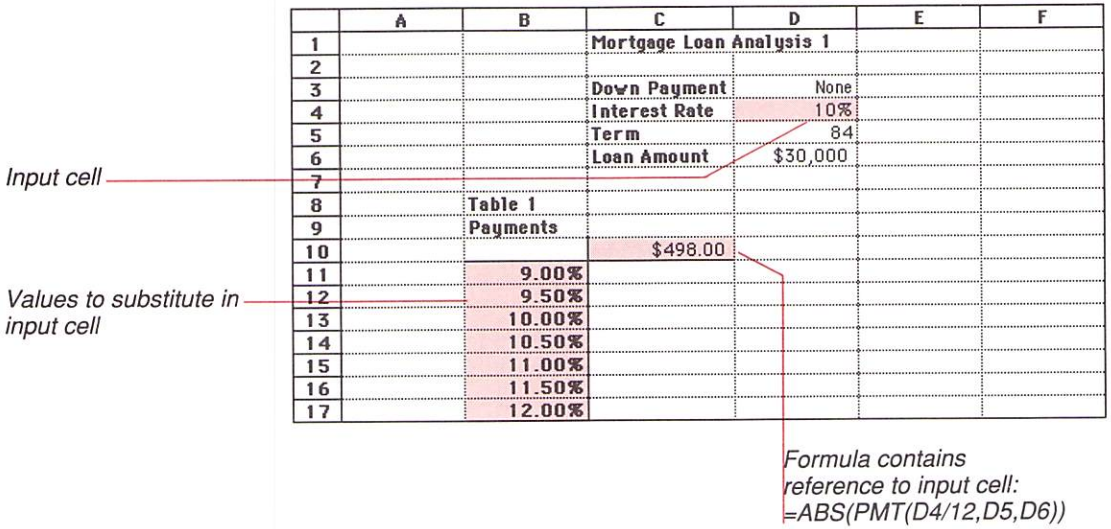
2. In a column (or row), enter the values that you want to substitute in the formula.

   If the formulas are in a row, enter the values in the column to the left of the first formula, starting in the row below the formulas. If the formulas are in a column, enter the values in the row above the first formula, starting in the column to the right of the formulas. If you just have one formula, you can enter the values either way.

You can have as many values in this column (or row) as you want.

Tip If the values to be substituted are in regular increments (such as 1000, 2000, 3000, or 1.5%, 1.75%, 2%), you can save time by entering them with the Data Series command. For more information, see **Data Series command.**

For example, suppose you are considering getting a $30,000 mortgage, and want to see how your monthly payment would change depending on the interest rate of the loan. The following table is set up so that the interest rates in column B will be substituted in cell D4 — the input cell.



	A	B	C	D	E	F
1			Mortgage Loan Analysis 1			
2						
3			Down Payment	None		
4			Interest Rate	10%		
5			Term	84		
6			Loan Amount	$30,000		
7						
8		Table 1				
9		Payments				
10			$498.00			
11		9.00%				
12		9.50%				
13		10.00%				
14		10.50%				
15		11.00%				
16		11.50%				
17		12.00%				

Creating a One-Input Table
(Full Menus)

1. Select the rectangular range containing the formula(s) and the values to substitute.

   In this example, you would select B10:C17.
2. Choose Data Table.
3. In the dialog box, enter the reference to the input cell by typing it or by clicking the cell.

   If the values to be substituted are in a row, enter the reference to the input cell in the Row Input Cell box. If the values to be substituted are in a column, enter the reference to the input cell in the Column Input Cell box.

   In this example, the values to be substituted are in a column, so you enter the reference to the input cell, $D$4, in the Column Input Cell box.
4. Click the OK button.

   Microsoft Excel places each substitute value into the input cell and fills in the table with the results of the formulas.

   The input cell can be empty. That won't affect the values calculated in the table, but you may get an unusual result in the cell or cells containing the formulas. That is because Microsoft Excel is using zero as the value of the input cell.

After you carry out the Data Table command, the table from the previous example looks like this:

	A	B	C	D	E	F
1			**Mortgage Loan Analysis 1**			
2						
3			**Down Payment**	None		
4			**Interest Rate**	10%		
5			**Term**	84		
6			**Loan Amount**	$30,000		
7						
8		**Table 1**				
9		**Payments**				
10			$498.04			
11		**9.00%**	$482.67			
12		**9.50%**	$490.32			
13		**10.00%**	$498.04			
14		**10.50%**	$505.82			
15		**11.00%**	$513.67			
16		**11.50%**	$521.59			
17		**12.00%**	$529.58			

Values calculated by the Data Table command

Note Microsoft Excel has to calculate all the formulas that depend on the input cell every time it tests a new input value in the cell and every time you edit one of the formulas. Therefore, tables usually require more time to be calculated than normal worksheet formulas. You can control when tables are calculated by choosing the Options Calculation command and selecting the Automatic Except Tables option. Then, whenever you want Microsoft Excel to calculate the table, choose the Options Calculate Now command.

Adding Formulas to an Existing Table
(Full Menus)

Continuing with the preceding example, you could use a one-input table to see the effect of changing interest rates in more than one formula. You might, for example, have one formula that calculates the monthly payment for a seven-year loan and one formula that calculates the monthly payment for a six-year loan.

To add one or more formulas to an existing one-input table:

1. Enter the new formulas in the row or column containing the existing formulas. The new formulas should be adjacent to the existing formulas.

   In the example, you would enter the formula for the six-year loan in the cell to the right of the formula for the seven-year loan.
2. Select the rectangular range containing the formulas and the list of values.

   In the example, you would select B10:D17.
3. Choose Data Table.
4. Enter the reference to the input cell in the dialog box.

   In the example, you would enter $D$4 in the Column Input Cell box.
5. Click the OK button.

The following data table shows the monthly payment for a seven-year and a six-year loan, depending on the interest rate.

	A	B	C	D	E	F
1			Mortgage Loan Analysis 1			
2						
3			Down Payment	None		
4			Interest Rate	10%		
5			Term	84		
6			Loan Amount	$30,000		
7						
8		Table 1				
9		Payments				
10			$498.04	$555.78		
11		9.00%	$482.67	$540.77		
12		9.50%	$490.32	$548.24		
13		10.00%	$498.04	$555.78		
14		10.50%	$505.82	$563.37		
15		11.00%	$513.67	$571.02		
16		11.50%	$521.59	$578.73		
17		12.00%	$529.58	$586.51		

This cell contains the formula for the 6-year loan: =ABS(PMT(D4/12,72,D6))

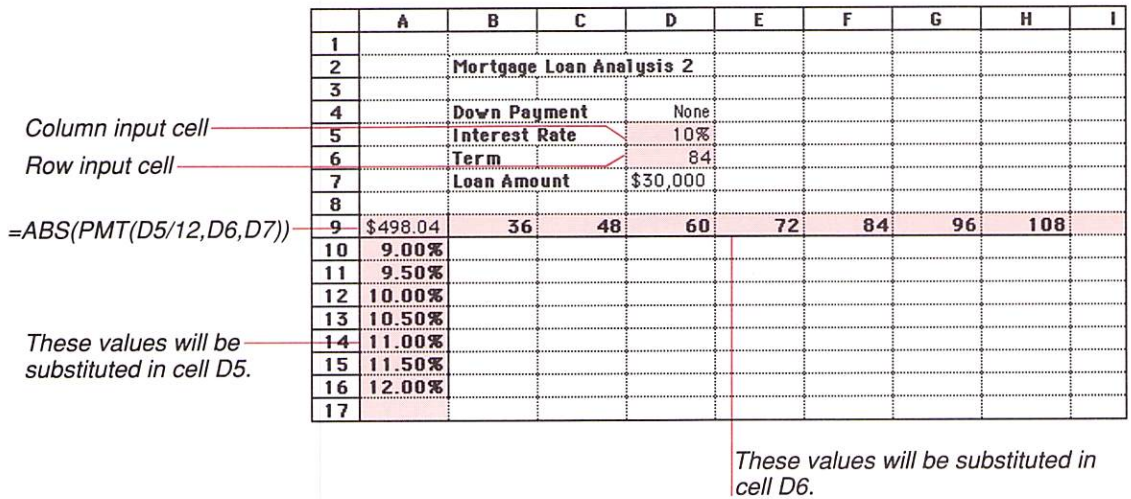
Using a Two-Input Table

If you would like to see how changes in two numbers affect one formula, use a two-input table. For instance, you could use a two-input table to see how your loan payments would vary depending on both the interest rate and the term of the loan.

Setting Up a Two-Input Table

1. In a cell, enter the formula that will use the substituted values. The formula should refer to two input cells, either directly or by referring to other cells that refer to the input cells. The input cells are the cells in which values will be substituted.
2. Starting in the cell below the formula, enter the values that you want substituted into one input cell. Enter these values in the same column as the formula.
3. Starting in the cell to the right of the formula, enter the values that you want substituted into the other input cell. Enter these values in the same row as the formula.

For example, suppose you are considering getting a $30,000 mortgage and want to see how your monthly payment would change depending on the interest rate and term of the loan.


Column input cell
Row input cell
=ABS(PMT(D5/12,D6,D7))
These values will be substituted in cell D5.
These values will be substituted in cell D6.

	A	B	C	D	E	F	G	H	I
1									
2		Mortgage Loan Analysis 2							
3									
4		Down Payment		None					
5		Interest Rate		10%					
6		Term		84					
7		Loan Amount		$30,000					
8									
9	$498.04	36	48	60	72	84	96	108	
10	9.00%								
11	9.50%								
12	10.00%								
13	10.50%								
14	11.00%								
15	11.50%								
16	12.00%								
17									

Creating a Two-Input Table
(Full Menus)

1. Select the range of cells containing the row and column of values and the formula.

   For this example, you would select A9:H16.
2. Choose Data Table.
3. In the Row Input Cell box, enter the reference to the input cell in which you want the row of values substituted. You can enter the reference by typing it or by clicking the cell.

   For this, you would enter $D$6.
4. In the Column Input Cell box, enter the reference to the input cell in which you want the column of values substituted.

   For this, you would enter $D$5.
5. Click the OK button.

After you carry out the Data Table command, the example table looks like this:

	A	B	C	D	E	F	G	H
1								
2		Mortgage Loan Analysis 2						
3								
4		Down Payment		None				
5		Interest Rate		10%				
6		Term		84				
7		Loan Amount		$30,000				
8								
9	$498.04	36	48	60	72	84	96	108
10	9.00%	$953.99	$746.55	$622.75	$540.77	$482.67	$439.51	$406.29
11	9.50%	$960.99	$753.69	$630.06	$548.24	$490.32	$447.33	$414.28
12	10.00%	$968.02	$760.88	$637.41	$555.78	$498.04	$455.22	$422.36
13	10.50%	$975.07	$768.10	$644.82	$563.37	$505.82	$463.20	$430.53
14	11.00%	$982.16	$775.37	$652.27	$571.02	$513.67	$471.25	$438.78
15	11.50%	$989.28	$782.67	$659.78	$578.73	$521.59	$479.38	$447.11
16	12.00%	$996.43	$790.02	$667.33	$586.51	$529.58	$487.59	$455.53
17								
18								

Values calculated by the Data Table command

Table Formulas

Microsoft Excel copies the same formula into every resulting cell in a table. The formula is enclosed in braces to indicate that the cell is part of a table and that you cannot edit the formula.

Here are some examples of table formulas:

Type of table	Formula	Description
One-input table with a row input cell	{=TABLE($D$9,)}	$D$9 is the input cell. Since the reference is followed by a comma, the cell is a row input cell.
One-input table with a column input cell	{=TABLE(,$E$8)}	$E$8 is the column input cell. Since the reference is preceded by a comma, the cell is a column input cell.
Two-input table	{=TABLE($D$9, $E$8)}	$D$9 is the row input cell; $E$8 is the column input cell.

Editing a Table

You can edit the input values or formulas in the left column or top row of a table. If Calculation is set to Automatic, Microsoft Excel immediately calculates the table after you edit. You can also copy just the resulting values inside a table. When you copy the resulting values, only the values are copied, not the table formulas. Other than copying, you cannot edit cells inside the table. If you try to edit a portion of the table, Microsoft Excel displays an error message.

Clearing the Values in a Table

If you've made an error in your table, such as entering the wrong reference to an input cell, you can clear just the resulting values. However, you must clear all of them.

1. Select all the resulting values in the table.
2. Choose Edit Clear.
3. Click the Formulas option.
4. Click the OK button.

Adding Input Values or Formulas to a Table (Full Menus)

1. Enter the new values or formulas in the blank cells at the bottom of the left column or at the end of the top row.
2. Select the entire table, including the new values or formulas.
3. Choose Data Table.
4. Enter the reference(s) for the input cell(s).
5. Click the OK button.

Microsoft Excel calculates the table with the new values or formulas.

Tip When moving or deleting a table, you can select the entire table by selecting one of the values calculated by the table, choosing Formula Select Special (full menus only), and then clicking the Current Array button.

Moving a Table

1. Select the entire table, including the input values, the formulas, and the resulting values inside the table.
2. Choose Edit Cut.
3. Select the paste area.
4. Choose Edit Paste.

Deleting a Table

1. Select the entire table, including the input values, the formulas, and the resulting values inside the table.
2. Choose Edit Clear.
3. Click the Formulas option.

Related Information

Reference

For information on	See
Calculating tables	Calculation
Two-input tables	Two-input table
One-input tables	One-input table

Sampler

Analyzing a Loan

Analyzing the Break-even Point

Data Table command

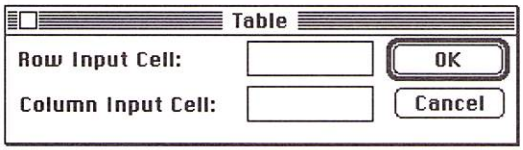
(Full Menus)

Creates a table based on the input values and formulas you define on a worksheet. You cannot create a table on a macro sheet.

For a one-input table, enter the reference of either the row input cell or the column input cell; for a two-input table, enter both.

If the Data Table dialog box hides an input cell that you want to select, you can move the dialog box by dragging its title bar with the mouse.

Procedures for creating a table are described in **Data table.**



Row Input Cell If your input values are in a row, put the input cell reference in this box. You can either type the cell reference or select the cell.

Column Input Cell If your input values are in a column, put the input cell reference in this box. You can either type the cell reference or select the cell.

If you are creating a two-input table, you must identify both a row and a column input cell.

Database

A **database** is a collection of data organized in a logical, consistent order that allows simple and flexible retrieval and updating. A Microsoft Excel database is a worksheet range to which you have assigned the name Database.

You can use a database in Microsoft Excel for the following tasks:

- Searching or querying the database to obtain information about the contents
- Extracting subsets of the data based on criteria you specify
- Performing statistical calculations on the data for analysis and decision-making
- Sorting data alphabetically and numerically by rows or columns in ascending or descending order
- Printing data organized for specific purposes

For example, you might structure a database as a list of clients, their addresses, and sales transactions. You could use the database to find all transactions during a certain period for one client or prepare a print-out summarizing those transactions.

This topic explains:

- Essential terms
- Setting up a database

  Creating a database
  Three ways to work with a database
  Editing a database
  Formatting a database
  Redefining the database range

- Using a data form

  The parts of a data form
  Working in a data form
  Editing records with a data form
  Adding a new record with a data form
  Deleting data with a data form
  Finding specific data with a data form
  A prototype for a custom data form

- Setting up a criteria range

  Creating the criteria range
  Using comparison criteria
  Using computed criteria
  Combining criteria
  Matching every record in a database

- Using database commands

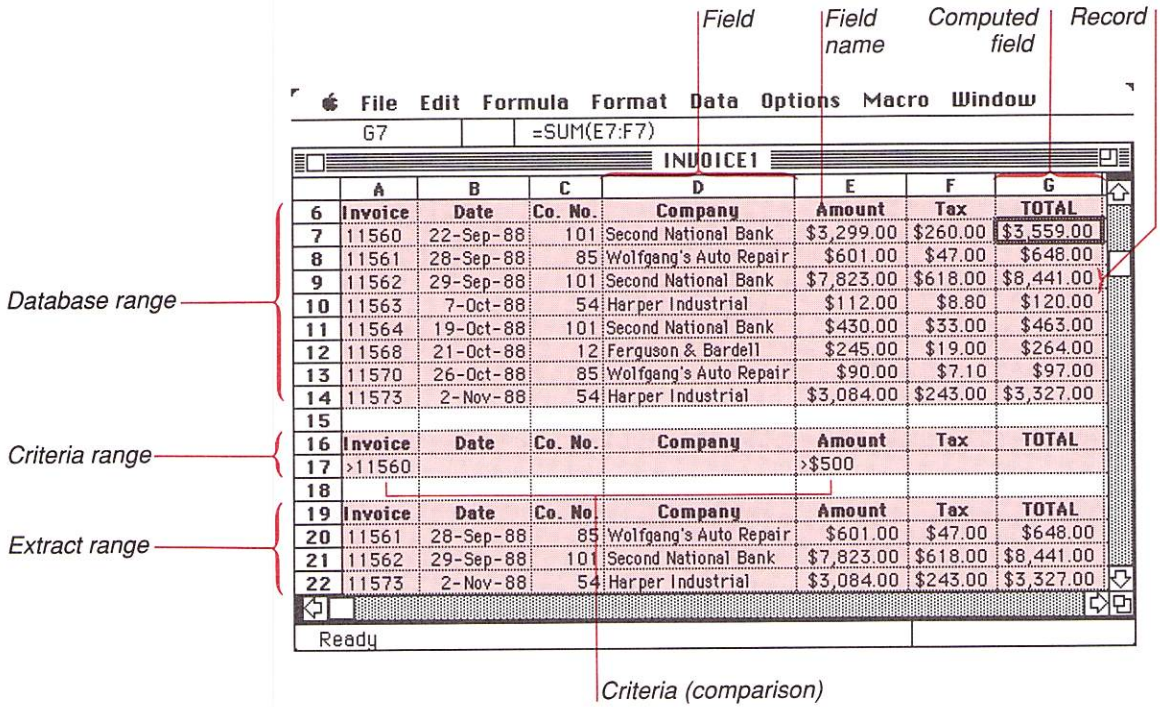
  Finding records
  Deleting records
  Extracting information

- Using database functions

For more information about procedures for sorting a database, which involves the same steps used for sorting any worksheet range, see **Sorting data.**

Essential Terms

The following illustration shows the parts of a database:



	A	B	C	D	E	F	G
6	Invoice	Date	Co. No.	Company	Amount	Tax	TOTAL
7	11560	22-Sep-88	101	Second National Bank	$3,299.00	$260.00	$3,559.00
8	11561	28-Sep-88	85	Wolfgang's Auto Repair	$601.00	$47.00	$648.00
9	11562	29-Sep-88	101	Second National Bank	$7,823.00	$618.00	$8,441.00
10	11563	7-Oct-88	54	Harper Industrial	$112.00	$8.80	$120.00
11	11564	19-Oct-88	101	Second National Bank	$430.00	$33.00	$463.00
12	11568	21-Oct-88	12	Ferguson & Bardell	$245.00	$19.00	$264.00
13	11570	26-Oct-88	85	Wolfgang's Auto Repair	$90.00	$7.10	$97.00
14	11573	2-Nov-88	54	Harper Industrial	$3,084.00	$243.00	$3,327.00
15							
16	Invoice	Date	Co. No.	Company	Amount	Tax	TOTAL
17	>11560				>$500		
18							
19	Invoice	Date	Co. No.	Company	Amount	Tax	TOTAL
20	11561	28-Sep-88	85	Wolfgang's Auto Repair	$601.00	$47.00	$648.00
21	11562	29-Sep-88	101	Second National Bank	$7,823.00	$618.00	$8,441.00
22	11573	2-Nov-88	54	Harper Industrial	$3,084.00	$243.00	$3,327.00

Database range — a rectangular area of the worksheet defined as a database. You use the Data Set Database command to define the database range on a worksheet. Microsoft Excel assigns the name Database to this range. You can use the name Database as you would any other named reference. For example, you can use the Formula Goto command with the name Database to quickly select the database range. In the preceding illustration, the range A6:G14 comprises the database range.

Record — a single row in a database. Each record contains the same fields as every other record in the database. In the illustration, the data for Wolfgang's Auto Repair in row 8 is a record.

Field — a single cell. Each column contains a different category of data or field. You can enter text, numbers, dates, formulas, or functions as field entries. For example, in the illustration, each record contains an "Invoice" field, a "Date" field, a "Co. No." field, a "Company" field, an "Amount" field, a "Tax" field, and a "TOTAL" field.

Computed field — a field containing formulas or functions. In the illustration, the "TOTAL" field is a computed field.

Field name — a name that identifies the data stored in a field. The top row of a database contains the field names. In the illustration, "Co. No." and "Company" are field names.

Criteria — the instructions that tell Microsoft Excel which records in a database to find, extract, or delete. You set up criteria in a range of cells on the worksheet; Microsoft Excel uses the criteria to "test" the database and find, extract, or delete the data that matches that criteria. You can specify two types of criteria: comparison criteria and computed criteria.

Comparison criteria — a type of criteria used to find, extract, or delete records in a database. Microsoft Excel "tests" the database by comparing the value of a particular field against what you specify as the comparison criteria. In the illustration, ">11560" and ">$500" are comparison criteria.

Computed criteria (not shown) — a second type of criteria used to find, extract, or delete records in a database. Microsoft Excel "tests" the database against the result of a formula that refers to one or more fields in one or more records.

Criteria range — a separate area of the worksheet set aside to store the criteria you specify. In the illustration, the range A16:G17 comprises the criteria range.

Extract range — a separate area of the worksheet set aside for data retrieved and copied from the database. When you extract data, Microsoft Excel finds records (based on criteria you specify) and copies them to the extract range. In the illustration, the data in rows 20 to 22 are three of the records that meet the criteria specified in the criteria range.

Setting Up a Database

Logical, consistent structure is the key to a powerful database. Before you begin creating your database, think about how you'll use it. With careful planning, you can create a database that lets you retrieve data quickly and uses worksheet space efficiently.

Follow these guidelines for organizing a database:

- **Create the records from the events or items you want to track.** For example, if you have to track sales orders, make each sales order transaction a record in the database.
- **Create the fields from the categories of data you need to keep for each event or item.** For example, in tracking sales orders, you might need to know the date, the client's name, address, phone number, the quantity and price of each item ordered, and the order total. These would all become fields in the database.
- **Use a separate field for each item you may want to retrieve separately.** For example, if you want to sort addresses by zip code, create one field for addresses and a separate field for zip codes, rather than a single field containing both addresses and zip codes.
- **Use a small model to test the design of your database.** If you need to create a large database with many records, you might want to create the database with only 10 records and do a trial run with a few data retrieval techniques to see if the organization of the database suits your purposes.

Creating a Database

Once you've decided on a design for your database, enter the records according to the following guidelines and then define the database using the procedure in this section.

- **Field name location.** The first row of the database must contain the field names. You may want to leave several blank rows above the database for entering criteria, tables, or other formulas.
- **Allowed values in field names.** Field names must be text constants (enclose field names with numbers in quotation marks). Do not use numbers, logical values, error values, blank cells, or formulas as field names. Otherwise, the database commands will not work properly.
- **Length of field names.** Field names may be a maximum of 255 characters in length. However, it's best to use brief field names and keep the contents of any field to a minimum. This lets you use narrower column widths and view more of the database at one time.

- **Records.** Every record must have the same fields, but you don't have to enter data in each field. Be careful not to insert extra spaces at the beginning or end of each entry in a field, because extra spaces can affect database functions or the results of a search.
- **Capitalization.** You can use either uppercase or lowercase letters. Microsoft Excel ignores capitalization when searching or sorting.
- **Formulas.** In your database, you can include typical worksheet formulas that calculate field values from other field values. For example, you might have an "Amount" field that multiplies quantity ordered by price in every record. You can also perform calculations as part of your criteria when you find, delete, or extract information from the database. For more information, see "Using Computed Criteria," later in this topic.

To create a database:

1. Enter the field names in the first row of the area that will become the database range.
2. Enter the records in the rows below the field names.
3. Select all the cells in the entire database range, including the field names and an extra blank row below the database for future expansion.

   You can insert new records anywhere in the database above the blank row without redefining the database; Microsoft Excel automatically expands the range.
4. Choose Data Set Database to define the database range.

   Microsoft Excel names the selected range of cells, Database.

A database can be as large as an entire Microsoft Excel worksheet.

Microsoft Excel looks for the name Database to determine which range of cells to work with. For this reason, only one database at a time can be defined with the name Database. However, you can still set up several databases on a single worksheet, and switch between them by redefining the database range.

Tip You can set up your worksheet to perform database operations using a database or criteria range on another worksheet or macro sheet. To do this, you use the Formula Define Name command, instead of the Data Set Database or Data Set Criteria command, to name a database range or criteria range.

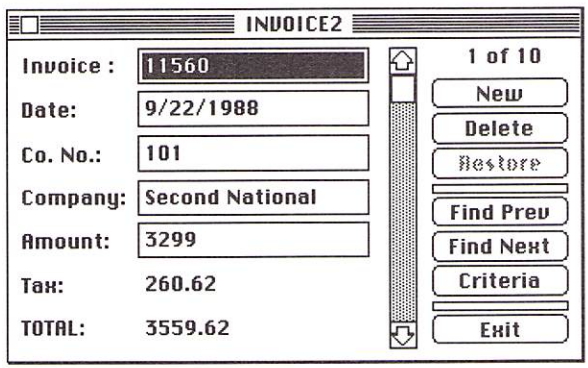
For example, to extract records from range A1:D200 on the TAX worksheet, while SUMMARY is the active worksheet, you would use the Formula Define Name command to define an external reference formula (=TAX!$A$1:$D$200) as the name Database. For information on defining names, see **Names.** For information on external reference formulas, see **Linking documents.**

Three Ways to Work with a Database

You can work with any database you create in three ways:

- **Use a data form.** A data form is a dialog box that provides a simple way to view, change, add, delete, or find records in a database. You can use a data form without learning all the specifics of setting up criteria and extract ranges or other details of database architecture. You might prefer this method if you're just starting to use databases or if you are setting up a database for someone else to enter data.

  The following illustration shows the data form for the database shown in the preceding section of this topic. Microsoft Excel takes the field names you set up and automatically creates a data form based on them, as shown in the following illustration. You can also create custom data forms.



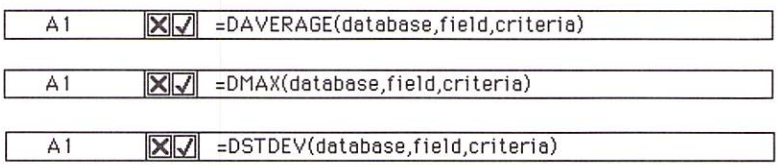
  For information on using data forms, see "Using a Data Form," later in this topic.

- **Use the Data menu commands.** The Data menu commands let you find records using comparison criteria, as you can in a data form. Using the Data menu commands you can also use computed criteria to find records. Additionally, you can extract all records matching the criteria to another range of the worksheet, and you can delete all records matching the criteria using the Data menu commands.

The Data menu commands shown below let you use the full power of the database (full menus shown).

For information on using the Data menu commands and database functions with a database, see "Setting Up a Criteria Range" and "Using Database Commands," later in this topic.

- **Use the database functions to compute database statistics.** You can use database functions to compute specific database statistics such as the sum or average of a certain field for all the records of the database that satisfy the criteria. Here are a few examples of database functions, shown with argument placeholders:



These database functions average numbers, find a maximum number, and calculate standard deviation, respectively.

For a brief summary of database functions, see "Using Database Functions," later in this topic. For complete information on database functions, see *Microsoft Excel Functions and Macros.*

Editing a Database

You can edit a database using any of the editing techniques for worksheets, such as adding or deleting rows and columns, or copying data. When adding or deleting records, use the following guidelines to make sure that your database range remains valid and includes all records:

- If you add new or blank records with the Edit Insert command, make sure you insert them above the last record of the database. Otherwise, you will need to redefine the database range to include the new records. To avoid having to redefine the database, include a blank record at the end of the database range and add new records above the blank row.
- If you delete records in the middle of a database, Microsoft Excel automatically adjusts the database range.
- Deleting the last record of a database affects the database range, so you should keep the last record of the database blank.
- Changing the order of records other than the last record or changing the order of fields other than the first and last fields does not affect the database range. Sorting the records or fields never affects the name.

For information on editing a database using a data form, see "Editing Records with a Data Form," later in this topic. For information on worksheet editing procedures, see **Editing a document.**

Tip Many of the display formats and options you use to view normal worksheet ranges — such as opening multiple windows or splitting a window into panes — are also extremely useful for working with large databases.

Formatting a Database

You can format the database with any of the worksheet formatting options, such as alignment or column width adjustments, font choices, and built-in or custom number formats.

Here are a few hints about formatting a database:

- Because all entries in a field are similar, it's usually best to use the same formats for an entire field.
- Exclude the field names when formatting a field because the same formats generally don't apply. Field names are often text, whereas the data they describe may be numbers or text in special formats.

For more information on worksheet formatting options, see **Formatting a document.**

Redefining the Database Range

You can enter more than one database on the same worksheet, but you can define and use only one database at a time. When you want to use another database on the same sheet, redefine the database.

1. Select the new database range, including field names and an extra blank row below the last record in the database.
2. Choose Data Set Database.

Using a Data Form

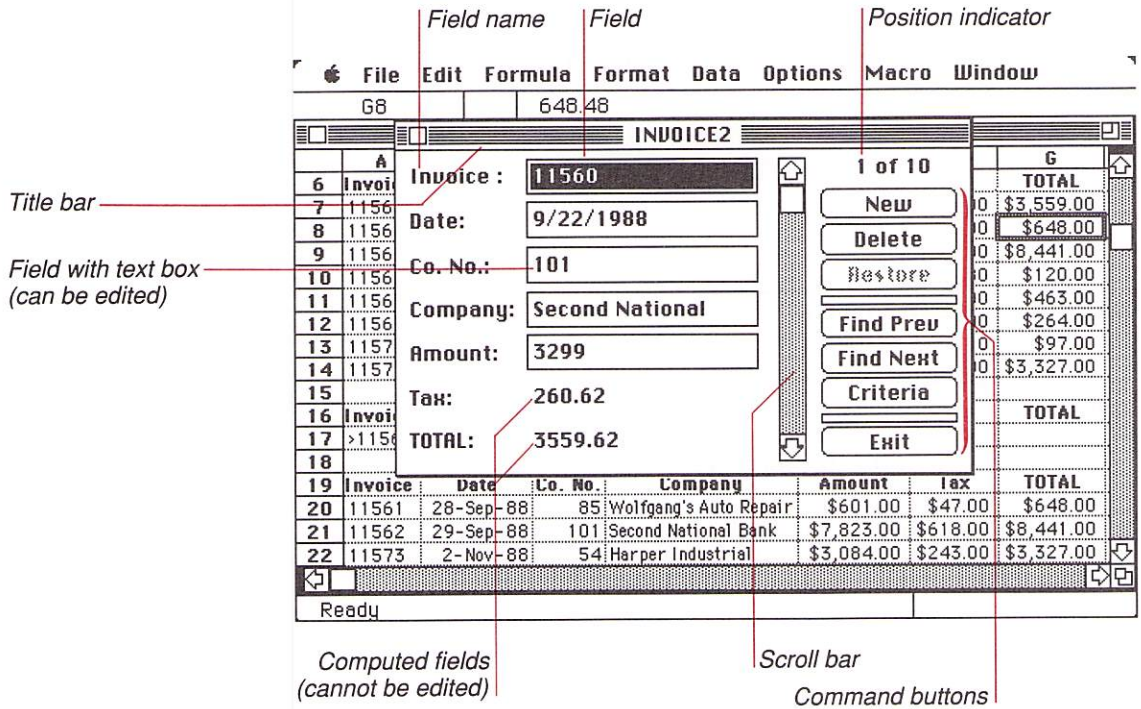
For many database tasks, a data form is an easier alternative to the commands on the Data menu. With a data form, you can view, change, add, and delete records in your database, or find specific records based on criteria you specify while the form is displayed. You cannot extract records with a data form.

The data form works independently from the other menu commands you use to manipulate a database — the Data Find, Data Extract, Data Delete, and Data Set Criteria commands. It also operates independently from any criteria range you may have set up. If you use criteria within the data form to find specific database records, those criteria will not affect any criteria in the criteria range.

The Parts of a Data Form

When you define a database and choose the Data Form command, Microsoft Excel creates a data form based on your database and displays it in the Data Form dialog box. The data form displays all fields for one record at a time and gives you access to all records in your database.

The following illustration shows how the data form looks for the database example used earlier in this topic and highlights the parts of a data form:



Field names — the field names from your database, listed in a column.

Fields — the column next to the field names that contains the data for each field within the record. These fields collectively make up one database record.

Field with text box — field data you can edit with the data form. Any field that you can edit appears in a text box.

Field without text box — a field whose entries you cannot edit. You cannot edit a field that is the result of a formula or function, or a field that is locked while the worksheet is protected.

Scroll bar — a bar that allows you to scroll through the records. The scroll bar shows your approximate position in the database range.

Position indicator — the message that indicates which record is displayed and how many non-blank records are in the database. Blank records at the end of the database are not counted. The position indicator changes to "New Record" when you scroll to the first blank record after the last non-blank record in the database.

Title bar — the bar at the top of the data form that shows the name of the worksheet containing the database.

Note To see areas of your database behind the data form, drag the title bar of the data form with the mouse.

Working in a Data Form

A data form is always displayed in the Data Form dialog box. To work in a data form, use any of the standard mouse techniques for working in dialog boxes or any of the following standard keyboard techniques:

To	Press
Select a field	Command + underlined letter in field name
Choose a command button	Command + underlined letter in button
Move to next field in record	Tab
Move to previous field in record	Shift + Tab
Move to first field in next record	Enter
Move to first field in previous record	Shift + Enter

Editing Records with a Data Form

You can use a data form to edit the fields of a record, except for protected fields and computed fields. If you can edit a field, the data is displayed in a text box. To edit in a data form, use standard procedures for editing in a text box.

1. Activate the worksheet window containing the database.
2. Choose Data Form.
   Microsoft Excel displays the data form as a dialog box.

3. Edit the records you want, using the mouse or keyboard techniques discussed in the preceding section of this topic.
4. When you finish working in the data form, click the Exit button to exit the data form.

Important Changes to a record are saved permanently when you move to another record. Make sure your changes are correct before scrolling to another record.

If you make changes to the fields in a record and then decide you want to cancel those changes, you can restore the record to its original contents, as long as you do so before moving to a different record.

To cancel changes to a record:

- Click the Restore button.

For information on locking a cell and protecting a worksheet, see **Protecting or hiding data.** For information on editing in a text box, see **Command, menu, and dialog box.**

Adding a New Record with a Data Form

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Click the New button. Or, drag the scroll box to the bottom of the scroll bar.

   Microsoft Excel scrolls to the first blank record after the last non-blank record, and the position indicator changes to "New Record."
4. Enter the data for the fields of this record.

Note If there are no blank records at the end of the database, and there is room below the database, Microsoft Excel extends the database range to include a new, blank record at the bottom of the database. If there is no room below the database, Microsoft Excel displays a message. If any fields in the last non-blank record are computed, Microsoft Excel copies their formulas to the new record.

Deleting Data with a Data Form

Important Deleted data cannot be restored with the Restore button. Before clicking the OK button, make sure you want to delete all the information in the record.

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Display the record you want to delete.
4. Click the Delete button.
   Microsoft Excel displays a message asking for confirmation.
5. Click the OK button.

Finding Specific Data with a Data Form

The data form scrolls through all records in your database. However, you can define criteria and use the Find Next or Find Prev button to quickly find records matching the criteria.

You can search the database for records that match these types of criteria:

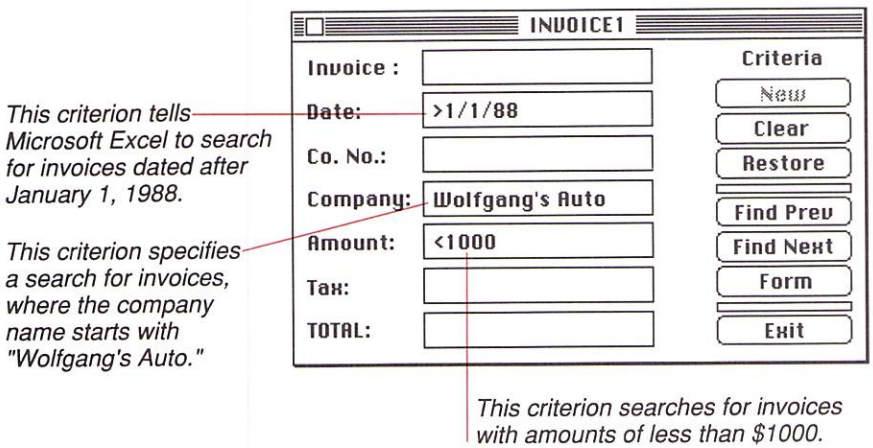
- **A series of characters you want matched.** Enter text, numbers, or logical values.
- **A quantity you want compared.** Enter one of the standard comparison operators in front of the value you want records compared to: =, >, <, >=, <=, <>.
- **A wildcard—a special character that stands for one or more characters.** Use a question mark (?) to find any single character in the same position as the question mark; for example, type *sm?th* to search for "smith" or "smyth." Use an asterisk (*) to find any number of characters in the same position as the asterisk—for example, type **Inc.* to find all companies with "Inc." at the end of their company names.

Note All text strings in comparison criteria have an implicit * appended to them. For example, if you type *John*, Microsoft Excel will find "John," "Johnson," or "John & Tom, Inc."

To find an actual question mark or asterisk, precede it with a tilde (~).

You cannot specify computed criteria in a data form. For information on specifying computed criteria in a database, see "Setting Up a Criteria Range," later in this topic.

The following illustration shows how criteria might be specified in the data form example used earlier in this topic:



To search the database for records matching your criteria:

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Click the Criteria button.

   The position indicator changes to the word "Criteria," the Criteria button changes to the Form button, and the Delete button changes to the Clear button. The Clear button clears all existing criteria.
4. In the text boxes next to the field name, type the criteria you want Microsoft Excel to use when searching the database.

   If you want to return to the regular form without searching the database, click the Form button.
5. Click the Find Next button to search forward through the database and display the next record that matches the criteria.

   Click the Find Prev button to search backward through the database and display the previous record that matches the criteria.
6. When you finish, click the Exit button to exit the data form.

A Prototype for a Custom Data Form

You can create a custom data form that Microsoft Excel displays whenever you choose the Data Form command. A **custom data form** is an ideal tool for setting up easy-to-use databases in applications you may develop for other users, especially those less familiar with database procedures.

The basis of a custom data form is a description of a custom dialog box. With this description, you specify a custom form that contains the same types of elements as the default form. Then you define the name Data_Form to refer to the range in which you entered the description of the dialog box.

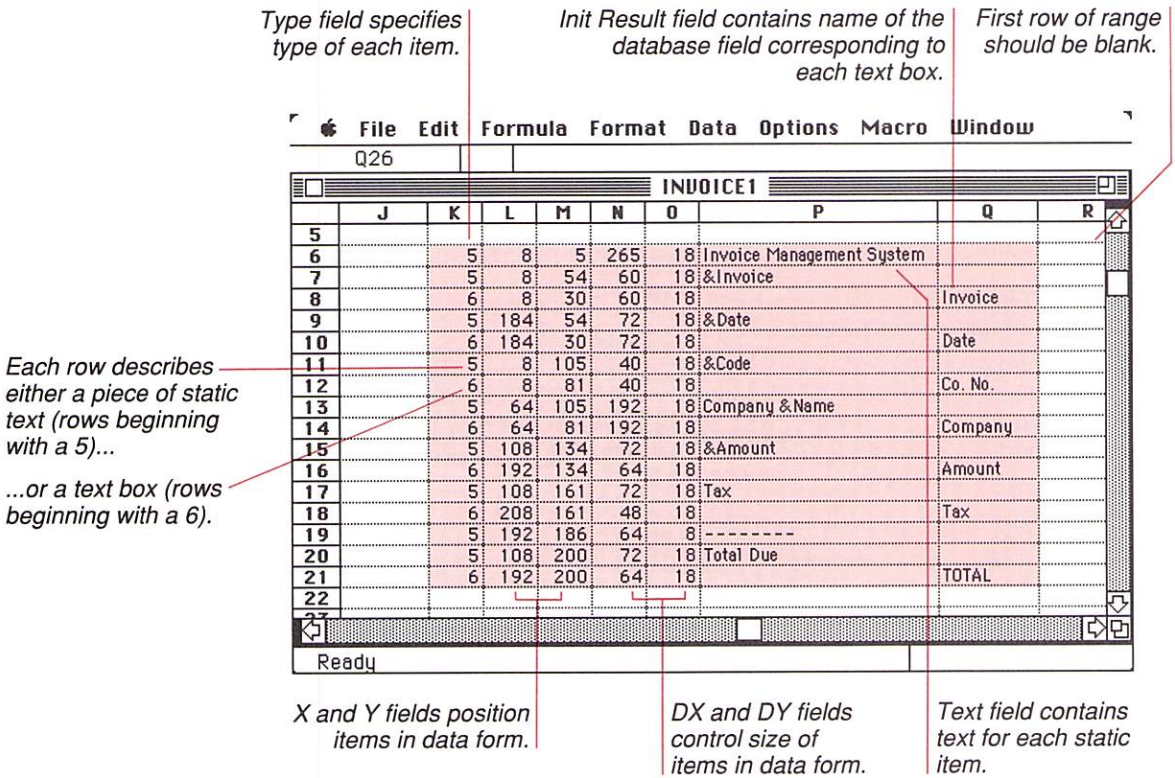
Your custom form contains the same elements as the default form:

- **Static text** — the labels that identify fields and any extra labels you want to add to your form.
- **Text boxes** — boxes in which you can type and edit text for fields that are not protected or computed. For fields that are protected or computed, Microsoft Excel displays the field contents without the box and does not let you edit them. Each text box corresponds to a field in the database.

The customized data form replaces the part of the standard data form to the left of the scroll bar. The scroll bar and command buttons do not change.

Microsoft Excel Functions and Macros provides guidelines for creating custom dialog boxes. However, you can start creating your own custom data forms right away by using the example in this section as a prototype.

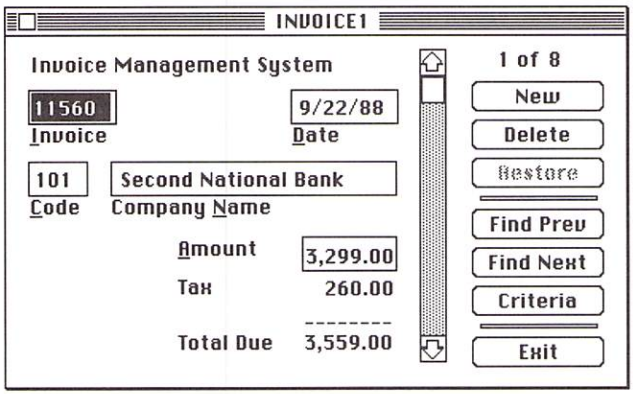
The following illustration shows a description for a custom dialog box for the database example used earlier in this topic. The description is in the named range Data_Form (K6:Q21, shown below as tinted):


Type field specifies type of each item.
Init Result field contains name of the database field corresponding to each text box.
First row of range should be blank.
File Edit Formula Format Data Options Macro Window
Q26
INVOICE1
Each row describes either a piece of static text (rows beginning with a 5)...
...or a text box (rows beginning with a 6).
Ready
X and Y fields position items in data form.
DX and DY fields control size of items in data form.
Text field contains text for each static item.

	J	K	L	M	N	O	P	Q	R
5									
6		5	8	5	265	18	Invoice Management System		
7		5	8	54	60	18	&Invoice		
8		6	8	30	60	18		Invoice	
9		5	184	54	72	18	&Date		
10		6	184	30	72	18		Date	
11		5	8	105	40	18	&Code		
12		6	8	81	40	18		Co. No.	
13		5	64	105	192	18	Company &Name		
14		6	64	81	192	18		Company	
15		5	108	134	72	18	&Amount		
16		6	192	134	64	18		Amount	
17		5	108	161	72	18	Tax		
18		6	208	161	48	18		Tax	
19		5	192	186	64	8	--------		
20		5	108	200	72	18	Total Due		
21		6	192	200	64	18		TOTAL	
22									

Note the ampersands (&) in the Text field. Characters following an ampersand are underlined in the custom dialog box. As with a normal dialog box, you can press Command+ the underlined letter to move quickly to an item.

The description in the preceding illustration produces the custom data form shown in the following illustration:



To create a custom form, use the Dialog Editor (a separate application provided with Microsoft Excel) to insert and arrange the text items and edit boxes in the left half of the dialog box. For information on creating custom dialog boxes, see Chapter 7, "Custom Menus and Dialog Boxes" in *Microsoft Excel Functions and Macros.* For instructions on using the Dialog Editor, see Appendix A, "The Dialog Function" in *Microsoft Excel Functions and Macros.*

After you have created the dialog box description:

1. Quit the Dialog Editor.
2. Click the Yes button to save the dialog to the Clipboard.
3. Start Microsoft Excel and open your database document.
4. Select the first cell of the range where you want the dialog box description inserted.

   Make sure that there is no data in the cells where the dialog box description will be inserted. The dialog box description will overwrite any data in the range where it is inserted.
5. Choose Edit Paste.

   The dialog box description is inserted and remains selected.

6. Choose Formula Define Name.
7. In the Name box, type *Data_Form.*
8. Make sure the range containing the description is correct in the Refers To box. Edit the range, if necessary.
9. Click the OK button.

Whenever you choose the Data Form command, Microsoft Excel brings up the custom form by default.

If you are developing a custom application, you can make the form even easier to use by adding custom Help to it. The procedure for doing this is the same as for custom dialog boxes. For more information on custom dialog boxes, see *Microsoft Excel Functions and Macros.*

Setting Up a Criteria Range

After you have defined a database range, you can find or extract records in your database that meet the **criteria** you specify. For example, you may want to find all the records for clients who are based in Atlanta. Or, you may want to find records for all clients in Atlanta who have orders of more than five items. These are examples of **comparison criteria.** Microsoft Excel compares the values you type—*Atlanta* and *>5*—to the values of the fields in the database. If the criteria are met, Microsoft Excel finds the records.

If you want to find records that meet criteria for which you have not entered a field, you can use **computed criteria.** For example, you might want to find records where the quantity ordered times the price is greater than $500.00. If you had an "Amount" field that already multiplied quantity ordered and price, you could type the comparison criterion *>$500.00*. If you did not have an "Amount" field, however, you could enter the formula as the criteria: *=quantity*price>500.00*. Microsoft Excel evaluates this formula to see if the criterion is met.

The **criteria range** tells Microsoft Excel which records in your database you want to find, delete, or extract information from. After you set up your criteria range, you can choose the Data Find command to find and select specific records, the Data Extract command to find and copy information to another part of your worksheet, or the Data Delete command to find and delete records you no longer need.

Note The criteria range on your worksheet is completely independent of any criteria you define while using a data form.

Creating the Criteria Range

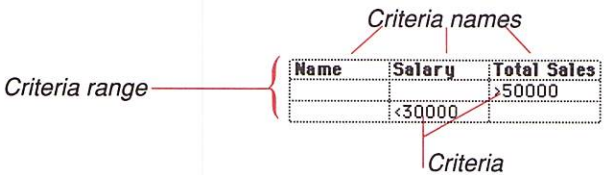
Like the database range, there are three steps to creating your criteria:

- Enter the **criteria names** in one row of the worksheet.
- Enter the **criteria** in the rows below the criteria names.
- Define the **criteria range** — the area where you entered the criteria names and the criteria.

Entering Criteria Names and Criteria

You enter the criteria range on the same worksheet your database is on. The criteria range can be any area on the worksheet outside your database range.

The first row of the criteria range contains the criteria names; the rows below the criteria names contain the criteria. The criteria range must be at least two rows high and one column wide, but can be as large as you wish.



Tip You may make frequent changes in the criteria range, so put your criteria range where it will be easy to edit. You may want the criteria range right above the database, so that if you expand the database you don't have to move the criteria range.

If you are using comparison criteria, the criteria names are the names of the fields you want Microsoft Excel to look in. You need only include the names of fields you are interested in, in any order. A quick way to create criteria names is to copy and paste your field names from the database range. Criteria name cells can contain either text or formulas that produce text. You can have more than one cell with the same criteria name.

If you are using computed criteria, you can enter any name as the criteria name as long as you don't use a field name from your database. Use text that describes the formula you will use as the computed criteria.

Below each criteria name, you type the criteria. For comparison criteria, you type the specific value you want the field compared to. For computed criteria, you type a formula. You do not have to enter a criterion under every criteria name. If a criterion cell is blank, Microsoft Excel ignores it when comparing criteria. For more information on specifying criteria, see "Using Comparison Criteria" and "Using Computed Criteria" in this topic.

To let Microsoft Excel know where your criteria range is, you define the criteria range with the Data Set Criteria command. You can keep more than one criteria range on your worksheet, and then define each one as you need to use it, but you can have only one range defined as the criteria range at a time. You can define the criteria range before or after you enter your criteria names and criteria.

For information on what to enter in your criteria range, see "Using Comparison Criteria" and "Using Computed Criteria," later in this topic.

Defining a Criteria Range

To define the criteria range:

1. Select the area that contains or will contain your criteria names and criteria.
2. Choose Data Set Criteria.

Microsoft Excel names the range Criteria. You can use the name Criteria as you would any other named reference. For example, to quickly select the criteria range, choose the Formula Goto command and select the name Criteria.

Instead of using the Data Set Criteria command, you can name a criteria range by selecting the range, choosing the Formula Define Name command, and typing *Criteria* in the text box. You can define the name Criteria as a range of cells on another worksheet (or on a macro sheet) by using the Formula Define Name command. Doing this lets you fill a worksheet with database records without having to leave a blank area for the criteria range. For more information, see "Creating a Database," earlier in this topic.

Tip If you will be changing your criteria frequently to find different information, display the criteria range in a separate window so you can move back and forth between your database and criteria without having to scroll each time. For more information on using windows, see **Windows.**

Using Comparison Criteria

When you choose the Data Find command, Microsoft Excel finds a database record if it matches the criteria in one row of your criteria range.

Microsoft Excel can find records for more than one criterion — for example, all clients who owe more than $150.00 and less than $500.00. Microsoft Excel can also find records based on criteria that depend on or refer to more than one field — for example, all clients who are located in New York and owe more than $150.00.

With comparison criteria, you either type the exact value or text you want Microsoft Excel to find as your criteria, or type a comparison operator followed by a value.

If you want to find records that contain an exact value, you type the text, number, date, or logical value below the criteria name.

The criteria range in the following illustration finds all the records of customers in the database whose zip code is 98111.

Criteria range

	A	B	C	D	E	F
1	Zip					
2	98111					
3						
4	**Last Name**	**First Name**	**Zip**	**1st Purch**	**2nd Purch**	**Date 1st Purch**
5	Braun	Edna	00107	$145.00	$0.00	7/2/88
6	Brown	Phillip	44935	$27.00	$0.00	11/10/88
7	Frei	John	62101	$50.00	$15.00	12/28/88
8	McIntyre	Janet	98111	$6.90	$0.00	1/19/88
9	Samuels	Carol	30033	$12.00	$32.00	6/30/88
10	Smith	Jane	94117	$21.00	$172.00	1/19/88
11	Smithson	Rosalie	99234	$87.00	$27.00	3/4/88
12	Wright	Mari	55607	$45.00	$127.00	11/16/88

When you type text as a criterion, Microsoft Excel matches everything that begins with what you type. For example, if you type *br* instead of *braun,* Microsoft Excel finds records for both Braun and Brown. Capitalization is ignored.

Note To match the value *text* exactly, use the following form:

="=*text*"

For example, in the preceding database, you would type ="=*Smith*" to find only the record for Smith, but not for Smithson.

You can also use "wildcards" to find text that shares some characters but not others. A **wildcard** is a special character that stands for other characters in text. Microsoft Excel recognizes two wildcards:

Character	Meaning
? (question mark)	Any single character in the same position as the question mark
* (asterisk)	Any number of characters in the same position as the asterisk

To find an actual question mark or asterisk, precede it with a tilde (~).

If you want to find records that fall within certain limits, type a comparison operator followed by the value, under the criteria name. For example, to find all the transactions of more than $10,000 you would type *>10000* as your criterion.

The six comparison operators are:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

For information on comparison operators, see **Operator.**

Note To find an exact match, use the "equal to" comparison operator (=) in the following form: *="=text"*

A comparison criterion must start with one of the comparison operators.

An equal sign with nothing after it will find blank fields only. A "not equal to" operator (<>) finds non-blank fields only.

The criterion can also be the result of a formula that produces text. For example, to select all records for the last 30 days you could use the criterion *=">=NOW()−30"* in a field that lists dates.

To find records that match values within a certain range, use two comparison criteria in two cells under the same criteria name. For example, to find records of customers whose zip codes are between 40000 and 90000, you would type *>40000* in the cell under the Zip criteria name, and type *<90000* in the cell below it and include both rows in the criteria range.

Using Computed Criteria

With computed criteria, you type a formula as your criterion. The formula can refer to one or more fields in your database, and produces the logical value TRUE or FALSE. The formula can refer to fields, either by field name or by a reference to that field in the first record of your database. The formula can also refer to constant values, or to values outside the database. When referring to values outside the database, use absolute references.

Important When referring to database fields by their field names in computed criteria formulas, you must type the exact field name. Capitalization is ignored.

Microsoft Excel evaluates the formula once for each record. The record is selected if the formula's result is TRUE or a number other than zero. The record is not selected if the formula's result is FALSE, zero, or a text value or error value. The following criteria range will find records of all customers whose first purchase plus second purchase totals more than $100.

Criteria range

Contains formula =D5+E5>100

Displays TRUE because this formula is true for the first record.

	A	B	C	D	E	F
1	Total					
2	TRUE					
3						
4	**Last Name**	**First Name**	**Zip**	**1st Purch**	**2nd Purch**	**Date 1st Purch**
5	Braun	Edna	00107	$145.00	$0.00	7/2/88
6	Brown	Phillip	44935	$27.00	$0.00	11/10/88
7	Frei	John	62101	$50.00	$15.00	12/28/88
8	McIntyre	Janet	98111	$6.90	$0.00	1/19/88
9	Samuels	Carol	30033	$12.00	$32.00	6/30/88
10	Smith	Jane	94117	$21.00	$172.00	1/19/88
11	Smithson	Rosalie	99234	$87.00	$27.00	3/4/88
12	Wright	Mari	55607	$45.00	$127.00	11/16/88

If you want to use a formula that depends upon a field in a record other than the one being tested, refer to the field above or below the first record in the database. For example, you might want to find records where one client's first purchase was more than 10 days after the previous client's first purchase. You would build the formula so that you referred to the field containing the date in the second record (F6 in the example), minus the field directly above that field (the field containing the first purchase date for the first record in the example).

If you refer to a field by using its name in a formula, make sure it is a valid Microsoft Excel name, with no spaces. You can enter field names in formulas without defining them with the Formula Define Name command; if you enter a field name you didn't define, the error value #NAME? is displayed in the criterion cell, but the name is still recognized as a field name.

Combining Criteria

You can combine computed and/or comparison criteria in any combination to find records that match more than one criterion or match some combination of several criteria.

There are three ways to combine criteria:

- Select records that match one criterion **and** another criterion.
  For example, find records of customers whose last names begin with B **and** who made a first purchase greater than $50.
- Select records that match one criterion **or** another criterion.
  For example, find records of customers who have zip codes less than 40000 **or** greater than 90000.
- Any combination of "and's" and "or's."
  For example, find records of customers who spent more than $50 on their first purchase **and** whose zip codes are less than 40000 **or** greater than 90000.

You specify "and's" and "or's" by where you enter different criteria within a criteria range. To connect criteria by an "and" relation, enter them in the same row. To connect criteria by an "or" relation, enter them in different rows. Microsoft Excel finds any records that meet all the criteria in any one row of the criteria range.

This criteria range will find all customers whose last name begins with B **and** who made a first purchase greater than $50.

Last Name	1st Purch
B	>50

This criteria range will find records of all customers whose zip codes are less than 40000 **or** greater than 90000.

Zip
<40000
>90000

This criteria range will find records of all customers who spent more than $50 on their first purchase **and** whose zip codes are less than 40000 **or** greater than 90000.

1st Purch	Zip
>50	<40000
>50	>90000

Matching Every Record in a Database

To match every record in a database, use a blank row in your criteria range.

Last Name	1st Purch	Zip
	>50	

This criteria range will find every record in the database.

Using Database Commands

After you have set up your criteria range, you can use criteria to:

- Find and select records
- Extract records (find records and copy them to another part of your worksheet)
- Delete records

Finding Records

Use the Data Find command to find and select records in the database that match the criteria in the criteria range. To find records:

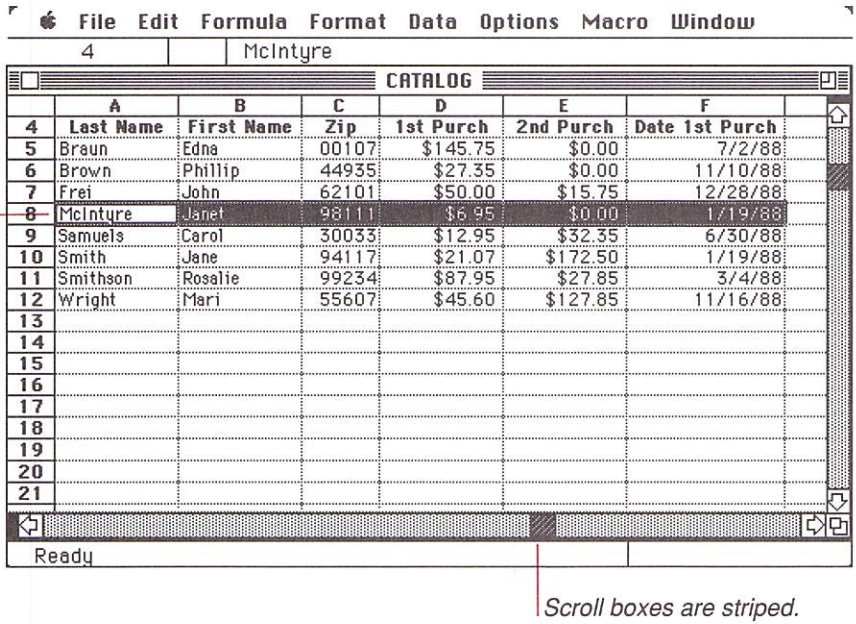
1. Make sure you have defined both your database range and your criteria range.
2. Choose Data Find.

   The scroll boxes become striped to show that you are in Data Find. Scrolling is different in Data Find, as described in the next section.

If the active cell is outside the database when you choose Data Find, Microsoft Excel selects the first record in the database that matches the criteria. If the active cell is inside the database when you choose Data Find, Microsoft Excel selects the first record below the active cell that matches the criteria. If no records match, a message is displayed.

If you hold down Shift when you choose Data Find, the initial search is in reverse order — Microsoft Excel selects the last record in the database that matches the criteria or, if the active cell is inside the database, the first record above the active cell that matches the criteria.

The following illustration shows how a worksheet looks in Data Find.


File Edit Formula Format Data Options Macro Window
4
McIntyre
CATALOG
A B C D E F
4 Last Name First Name Zip 1st Purch 2nd Purch Date 1st Purch
5 Braun Edna 00107 $145.75 $0.00 7/2/88
6 Brown Phillip 44935 $27.35 $0.00 11/10/88
7 Frei John 62101 $50.00 $15.75 12/28/88
8 McIntyre Janet 98111 $6.95 $0.00 1/19/88
9 Samuels Carol 30033 $12.95 $32.35 6/30/88
10 Smith Jane 94117 $21.07 $172.50 1/19/88
11 Smithson Rosalie 99234 $87.95 $27.85 3/4/88
12 Wright Mari 55607 $45.60 $127.85 11/16/88
13
14
15
16
17
18
19
20
21
Ready
This record matches the criteria.
Scroll boxes are striped.

Scrolling in Data Find

When Microsoft Excel is in Data Find, scrolling and selecting is restricted to those records that match the criteria.

To scroll in Data Find with the mouse:

To find	Do this
The next or previous matching record	Click the down or up scroll arrow
The next or previous matching record at least one window away	Click below or above the scroll box
The closest matching record in another portion of the database	Drag the scroll box

If there are no matching records in the direction you scroll, Microsoft Excel beeps and does not change the selection.

To scroll in Data Find using the keyboard:

To find	Press
The next matching record	Command + F key
The previous matching record	Shift + Command + F key
The first matching record at least one screen down from the selection	Page Down
The last matching record at least one screen up from the selection	Page Up

To move horizontally, press the Right Arrow key to move right and the Left Arrow key to move left. You cannot, however, move beyond the right or left boundary of the database.

Exiting Data Find

- Select any cell outside the database, choose Data Exit Find, or press Command + . (period).

The scroll boxes return to their normal pattern.

Deleting Records
(Full Menus)

Use the Data Delete command to delete records in the database that match the criteria.

Important Data Delete permanently deletes all records matching the criteria. You cannot undo Data Delete. If you are not sure that Data Delete will delete the right records, save your worksheet before choosing this command. Or, you can see which records will be deleted by the Data Delete command by creating your criteria, then using Data Extract or Data Find to select the records.

To delete records:

1. Define a criteria range that contains criteria for records you want to delete.
2. Choose Data Delete.
   A message warns you that records will be permanently deleted from the database.
3. Click the OK button.

Extracting Information

Use the Data Extract command to find database records that meet your criteria and copy fields from the records to another part of the worksheet.

Before extracting records from a database, you must:

- Define the database
- Enter criteria and define the criteria range
- Select an extract range

The Extract command uses the criteria range to select the records from which to extract data. An **extract range** is a range on your worksheet, just like a criteria range or the database, except that no special name is assigned to it. You simply select it before choosing the Data Extract command. The extract range must be outside your database.

The first row of your extract range must contain field names identical to those in your database. You don't need to include every field name from your database in the extract range, however. When you extract, only the fields that you specify in the first row of your extract range will be copied into the extract range. For example, you could use criteria that find records for clients who did less than $50,000 of business with you last year, but extract only their names and addresses.

If you select just the field names as your extract range, Microsoft Excel extracts all the records that match the criteria. If you select the field names and rows below the field names, Microsoft Excel extracts only as many records as will fit in that range. If there are more records than will fit, a message is displayed.

Important When you choose the Data Extract command, Microsoft Excel clears the entire extract range before it copies the records that match the criteria into the range.

If you select just the field names as your extract range, the extract range extends from below the field names to the bottom of the worksheet. When you choose Data Extract, everything below the field names is cleared.

To extract information from the database:

1. Make sure the database and criteria range are defined.
2. Select the extract range.
3. Choose Data Extract.
4. If you only want to extract one copy of repeated or partially repeated records, turn on the Unique Records Only check box in the Data Extract dialog box.
5. Click the OK button.

   Microsoft Excel finds the records that match the criteria you set in the criteria range. Then, from those records, Microsoft Excel copies information from the database fields that you specified in your extract range. If a record contains a formula, Microsoft Excel copies only the value that the formula produces, not the formula itself.

   If you selected a range of cells instead of just the field names, Microsoft Excel extracts only as much information as will fit in that range. If Microsoft Excel has more to extract when it reaches the end of the range, it displays a message indicating that the extract range is full.

Using Database Functions

There are 11 worksheet functions designed to work with databases.

To	Use
Average numbers	DAVERAGE
Count numbers	DCOUNT
Count non-blank cells	DCOUNTA
Find a maximum	DMAX
Find a minimum	DMIN
Multiply numbers	DPRODUCT
Calculate standard deviation	DSTDEV or DSTDEVP
Add numbers	DSUM
Calculate variance	DVAR or DVARP

For complete information on the database worksheet functions, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros.*

Related Information

Reference

For information on	See
Sorting in a database and a worksheet	Sorting data
Comparison operators	Operator
Using wildcards	Wildcard
Editing in a database	Editing a document
Formatting in a database	Formatting a document

You can find information about Microsoft Excel basics in the other core topics: **Chart; Command, menu, and dialog box; Help; Windows;** and **Worksheet.**

Functions and Macros

"Database Functions" in Chapter 2, "Worksheet Function Directory"

Sampler

Correcting for Instrument Drift

Managing Accounts Receivable

Date

You can use several built-in date formats or create custom date formats for use in your Microsoft Excel documents.

This topic explains:

- How Microsoft Excel stores dates
- Built-in date formats

  Formatting dates as you type

  Trouble-shooting date formats you type in

  Using the Format Number command to assign date formats

- Custom date formats

  Creating your own date formats

  Using a custom date format

  Deleting a custom date format

Note All worksheet date formats also apply to macro sheets.

How Microsoft Excel Stores Dates

Though you can display dates in several standard formats, Microsoft Excel stores all dates as serial numbers. In Microsoft Excel, serial numbers for dates run from 0 to 49710, where 0 is the number for January 1, 1904, and 49710 is the number for February 6, 2040. For example, the serial number for 6/1/85 is 29737.

Note You can switch to the 1900 date system, which is the default date system in Microsoft Excel for Windows, with the Options Calculation command. In the 1900 date system, the serial number 1 represents January 1, 1900 instead of January 2, 1904.

With dates stored as serial numbers, you can perform calculations using dates as you would other numbers. For example, using normal date formats, you can enter the date you purchase stock in one cell and enter the date you sell the stock in another cell. In a third cell, you can build a formula with references to these cells to subtract the two dates and find the number of days you held the stock. To calculate the formula, Microsoft Excel uses the serial numbers for those dates.

Note Microsoft Excel uses a decimal fraction added to the serial number to represent a specific time on a given date. For example, 29737.5 represents 12 noon on 6/1/85. For more information on time formats, see **Time.**

Built-in Date Formats

In Microsoft Excel, you can use the following built-in date formats:

Format	Examples
m/d/yy	2/13/88
d-mmm-yy	13-Feb-88
d-mmm	13-Feb
mmm-yy	Feb-88
m/d/yy h:mm	2/13/88 19:50

There are two ways to apply a built-in date format on a worksheet:

- **Format the date as you type.** You can type a date in one of the built-in formats (for example, type 6/25/86); Microsoft Excel automatically stores the serial number and, if the cell is formatted as General, assigns the date format to the cell.
- **Assign a built-in date format with the Format Number command.** You can assign any built-in date format to a cell or range with the Format Number command before or after you type the data.

Note Microsoft Excel also has several built-in worksheet functions for manipulating dates, times, and serial numbers. For more information, see *Microsoft Excel Functions and Macros.*

Formatting Dates As You Type

Microsoft Excel displays a date format as close as possible to what you type. If you type a date into a cell formatted in General format or one of the built-in date formats, Microsoft Excel stores its serial number and displays it as a date. For example, when you type *10/26/87* in a cell with General format, Microsoft Excel stores its serial number, 32076, and assigns the format m/d/yy to the cell.

You can also type dates in formats other than the built-in choices. Type the date as you want it, using the following guidelines:

- **Punctuation** — You can use a slash (/) instead of a hyphen (-), or vice versa.
- **Date and time** — You can type a date and time in the same cell. You must separate the date and time by a space. For example, you could type either *4/23/88 16:48* or *4:48 PM Apr-88.*
- **Capitalization** — You can type either upper- or lowercase letters in date formats. Microsoft Excel ignores capitalization when you type dates.

Trouble-shooting Date Formats You Type In

Microsoft Excel displays date formats you type in, in the nearest matching built-in date format, but in some cases, it may interpret your formats slightly differently than you intended.

Use the following trouble-shooting parameters if you're unsure about how Microsoft Excel is interpreting date formats you type in:

- **Month name and single or double digit—** Microsoft Excel interprets a month name followed by a single or double digit to be a month and year. For example, if you enter February 4, Microsoft Excel formats it as Feb-04 and interprets it as 2/1/04, not February 4th.
- **Entering dates in previously formatted cells—** If you enter a date in a cell with neither the General nor a date format, Microsoft Excel converts the date to a serial number and displays the serial value in the cell's format. For example, if you type *4-Apr* into a cell formatted to display dollar values, Microsoft Excel stores the serial number for the date, 30775, and displays it as $30,775. To display the number as a date, choose the Format Number command and select the date format you want.
- **Date formats Microsoft Excel does not recognize—** If Microsoft Excel does not recognize a date format you type, it stores the date as text instead of as a serial number. If you try to use the date in calculations that expect a number, Microsoft Excel returns the error value #VALUE!.
- **Non-existent dates—** If you enter a date that does not exist, such as 6/40/87, Microsoft Excel interprets it as text. If you try to use the date in calculations that expect a number, Microsoft Excel returns the error value #VALUE!.

Tip The formula bar shows how Microsoft Excel interprets a date format you type in. Check the cell entry there if you have questions about the formatting.

Using the Format Number Command to Assign Date Formats

1. Select the cells you want to format.
2. Choose Format Number.
3. In the list box, select a date format.
4. Click the OK button.

Custom Date Formats

You can create your own date formats for specialized uses in Microsoft Excel documents. Using a custom format can also simplify data entry. For example, you can format a range with a complex custom date format, type the data using a simpler format, and Microsoft Excel will display the data in your custom format.

The following table shows the date format symbols you can use for creating custom date formats.

This format symbol	Means this
General	Display the number in General format.
d	Display the day as a number without leading zeros (1–31).
dd	Display the day as a number with leading zeros (01–31).
ddd	Display the day as an abbreviation (Sun–Sat).
dddd	Display the day as a full name (Sunday–Saturday).
m	Display the month as a number without leading zeros (1–12).
mm	Display the month as a number with leading zeros (01–12).
mmm	Display the month as an abbreviation (Jan–Dec).
mmmm	Display the month as a full name (January–December).
yy	Display the year as a two-digit number (00–99).
yyyy	Display the year as a four-digit number (1904–2040).

Note If you use *m* or *mm* immediately after the *h* or *hh* symbol, Microsoft Excel displays the minute rather than the month. For more information, see **Time.**

Here are some examples of date formats you can create:

If a cell has this format	And you enter	Microsoft Excel displays
m-d-yy	4/1/87	4-1-87
mm dd yy	4/1/87	04 01 87
mmm d, yy	4/1/87	Apr 1, 87
mmmm d, yyyy	4/1/87	April 1, 1987

Creating Your Own Date Formats

You can create a custom date format in two ways:

- **Edit a built-in date format in the Format Number dialog box.** You can create a custom format similar to one that already exists by editing a built-in format in the list box. Use the date format symbols shown in the table earlier in this section. When you click the OK button, Microsoft Excel retains both the built-in format and your newly created custom format.
- **Type your own date format in the Format Number dialog box.** Using the date format symbols in the table earlier in this section, type the format you want in the Format text box.

To create a custom date format:

1. Select the cells you want to format.
2. Choose Format Number.
3. Select a built-in format from the list and edit it in the Format box. You can also type a new format in the Format box.
   Refer to the guidelines and table earlier in this topic.
4. Click the OK button.

Microsoft Excel formats the cells with the new format and adds it at the end of the list box so you can reuse it.

Using a Custom Date Format

1. Select the cells you want to format.
2. Choose Format Number.
3. Scroll to the end of the list box and select the custom format you want.
4. Click the OK button.

Tip Custom date formats are saved only with the worksheet in which they were created. To create a library of custom date formats, create the formats in a blank worksheet, apply each format to one cell or a range of cells on the worksheet, and save the worksheet. To use those formats in another worksheet, open the worksheet containing your custom date formats and copy the range of cells formatted with the custom date formats to the other worksheet. The custom date formats will then be available on the other worksheet.

Deleting a Custom Date Format

1. Choose Format Number.
2. Scroll to the end of the list box and select the custom format you want to delete.
3. Click the Delete button.
4. Click the OK button.

Note You cannot delete a built-in date format.

Related Information

Reference

For information on	See
Worksheet, chart, and database basics	Worksheet Chart Database
Time formats	Time
Using built-in number and text formats	Number Text
General overview of formatting options	Formatting a document

Functions and Macros

"Date and Time Functions" in Chapter 2, "Worksheet Function Directory"

Sampler

Creating an Automated Invoice System

Default settings

Default settings are the settings Microsoft Excel automatically uses when you start Microsoft Excel or when you create a new document. The worksheet and chart default settings are designed to help you produce a standard, presentable document without having to select your own settings. However, if you want to customize a document or use special formats, you can change settings that apply to an individual document without changing the defaults Microsoft Excel uses for other documents. You control most settings through the dialog box options for commands.

This topic explains:

- Worksheet default settings

  General worksheet defaults
  Worksheet window display defaults
  Worksheet printing defaults

- Chart default settings

  Defaults for chart objects, display, and formats
  Chart printing defaults

- Workspace default settings

Worksheet Default Settings

The tables in this section summarize various worksheet default settings. The right side of the table indicates the commands you use to control these defaults. Certain defaults such as display and printing settings usually apply to an entire worksheet. Other defaults you can change and apply either to an entire worksheet or to specific cells or cell ranges on a worksheet.

Note All worksheet defaults also apply to macro sheets.

General Worksheet Defaults

Setting	Default	Controlled by
Alignment of cell entries	General (text aligned left, numbers aligned right, error and logical values centered)	Format Alignment
Automatic backup	Off	File Save As (click Options button)
Border	Off	Format Border
Calculation (automatic/manual)	Automatic for all open worksheets	Options Calculation
Cell protection	Locked	Format Cell Protection and Options Protect Document
Column width	Standard (10 characters)	Format Column Width
Date	Serial numbers start at 0 (zero), which is January 1, 1904	Options Calculation
Document protection	Unprotected	File Save As (click Options button)
File format	Normal	File Save As (click Options button)
Font	Standard (Geneva 10-point, plain)	Options Standard Font
Iteration	Off; maximum iterations set at 100; maximum change set at 0.001	Options Calculation
Number display format	General	Format Number
Precision as displayed	Disabled (full precision)	Options Calculation
Row height in cells	Standard height; differs for each font size	Format Row Height
Shading	Off	Format Border

Worksheet Window Display Defaults

These settings apply to any new window opened on a worksheet.

Setting	Default	Controlled by
Cell contents display (values/formulas)	Values displayed (formulas displayed in macro sheets)	Options Display
Color (gridlines and row/column headings)	Automatic	Options Display
Color formats (text and numbers in worksheets and charts)	Black	Format Number
Gridlines (show/hide)	Show	Options Display
Info window contents display	Cell reference, formula, note displayed	Window Show Info (choose Info menu)
Mnemonics (underlined command letters)	Automatic	Options Workspace
Row and column headings (show/hide)	Show	Options Display
Zero values (show/hide)	Show	Options Display; Format Number

Worksheet Printing Defaults

All printing defaults apply to the entire worksheet.

Setting	Default	Controlled by
Footers	"Page" plus page number centered and printed	File Page Setup
Gridlines	Printed	File Page Setup
Headers	Document name centered and printed	File Page Setup
Margins	Left/right: 0.75 inch; top/bottom: 1 inch	File Page Setup
Note headings (cell references)	Printed	Print Row and Column Headings check box in File Page Setup

Setting	Default	Controlled by
Number of copies	One	File Print
Orientation: vertical or sideways (portrait or landscape)	Vertical (portrait)	File Page Setup
Page breaks	Automatic (fit maximum number of rows and columns in each page)	Options Set Page Break
Page range to print	All	File Print
Paper type	Varies with printer	File Page Setup
Print area	Entire sheet	Options Set Print Area
Print titles	Not printed	Options Set Print Titles
Row and column headings	Printed	File Page Setup

Chart Default Settings

The tables in this section summarize various chart default settings and indicate the commands you use to control these defaults.

Note The Automatic setting has two different effects. If you have a color display, various parts of a chart are first assigned solid colors up to the eight available colors (or more if your machine supports them). If more than eight colors are needed, Microsoft Excel rotates through the eight-color sequence with the addition of a pattern. This rotation continues through the eight colors, using each of the 16 different patterns, as needed. If you have a monochrome display, then Microsoft Excel rotates among the 16 patterns.

Most of these settings apply to specific chart objects rather than to the entire chart document. However, in a few cases, you can apply a setting to the entire chart. For example, you can format all of the text in a chart by selecting the chart and choosing the Format Text command. For information on formatting chart text, see **Chart text.**

Defaults for Chart Objects, Display, and Formats

Setting	Default	Controlled by
Area patterns (legend)	Automatic	Format Patterns
Area patterns (chart area, plot area, text)	Invisible	Format Patterns
Area patterns (chart markers)	Automatic	Format Patterns
Axes (show/hide)	Main chart: show category and value axes; overlay chart: hide category and value axes	Chart Axes
Borders (legend, data markers)	Automatic	Format Patterns
Borders (chart area, plot area, text)	Invisible	Format Patterns
Category axis formats	Value axis crosses category axis at first category; one category between tickmark labels; value axis crosses between categories	Format Scale
	Tickmark label position next to axes; major tickmarks: cross; minor tickmarks: none	Format Patterns
	Axis lines: Automatic	Format Patterns
Chart legend (show/hide)	Hide	Chart Add Legend
Chart legend position	Vertical (centered along right side of chart)	Format Legend
Chart legend data series labels	Data series names in series formula	Editing the series formula
Chart type (main)	Column chart	Format Main Chart
Chart type (overlay)	Line chart	Format Overlay
Color (text)	Automatic	Format Font

Setting	Default	Controlled by
Font	Geneva 10-point, plain	Format Font
Gridlines (category and value axes)	Hide	Chart Gridlines
Labels (category tick-marks)	Use categories of series 1 (for more information, see **Series formula** and **Chart**)	Editing the series formula; Edit Copy/ Paste Special
Line patterns (axis, line charts, gridlines, hi-lo lines, drop lines)	Automatic	Format Patterns
Plotting of data series in chart (based on worksheet selection)	Plot fewer data series than data points	Edit Paste Special (for more information, see **Chart data series**)
Tickmark label patterns	Tickmark labels next to axis; major tick-marks: cross; minor tickmarks: none	Format Patterns

Chart Printing Defaults

Setting	Default	Controlled by
Dimensions (fit to page/screen size/full page)	Fit to page	File Page Setup
Footers	"Page" plus page number centered and printed	File Page Setup
Headers	Document name centered	File Page Setup
Image height and width	Varies by printer	File Page Setup
Margins	Right/left: 0.75 inch; top/bottom: 1 inch	File Page Setup
Number of copies	One	File Print
Orientation: vertical or sideways (portrait or landscape)	Vertical (portrait)	File Page Setup
Paper type	Varies by printer	File Page Setup

Workspace Default Settings

The workspace default settings affect all open documents.

Setting	Default	Controlled by
Fixed decimal placement	Off; when turned on, set to 2	Options Workspace
Formula bar (show/hide)	Show	Options Workspace
Menus (full/short)	Short Menus	Options Full Menus; Options Short Menus
Reference style	A1	Options Workspace
References (macro recording)	Absolute	Macro Relative Record; Macro Absolute Record
Scroll bars (show/hide)	Show	Options Workspace
Status bar (show/hide)	Show	Options Workspace

Related Information

Reference

For information on	See
Summary of major worksheet, chart, and database features; technical details	Features and specifications
Worksheet, chart, database, workspace, and windows basics	Worksheet Chart Database Windows Workspace file
Formatting options (general overview)	Formatting a document
Printing worksheets, macro sheets, and charts	Printing a document

Deleting a document

When you need to delete a document from a disk, you don't have to quit Microsoft Excel. You can delete documents from within Microsoft Excel using the File Delete command.

Important The File Delete command cannot be reversed with the Edit Undo command. If you delete a document from your disk, you can't retrieve it. However, if you inadvertently delete a Microsoft Excel document that is currently open (in memory), you can restore the document to the disk by saving it with the File Save As command while it is still open.

Deleting a Document
(Full Menus)

1. Choose File Delete.
2. In the list box, select the document you want to delete.
3. Click the OK button.
   Microsoft Excel asks for confirmation before deleting the document. After you delete a document, the File Delete dialog box remains on the screen so you can select and delete other documents.
4. Click the Cancel button to close the dialog box.
   Documents you deleted before clicking Cancel remain deleted.

Related Information

Reference

For information on	See
Saving documents	Saving and closing a document
Working with folders	Folders

Deleting and clearing data

Deleting and **clearing** are two ways to remove data from a Microsoft Excel document. The distinction between the two techniques is very important for worksheets and macro sheets. Clearing a cell clears the contents, formats, or notes — or all three — from that cell, but leaves the cleared cell within the structure of the worksheet. Deleting a cell completely removes the cell and everything in it from the worksheet, and closes up the space that was occupied by the deleted cell.

This topic explains:

- Clearing versus deleting cells
- Clearing data from a cell or cell range
- Deleting a cell or cell range
- Deleting entire rows or columns
- Deleting data from a chart
- Deleting other types of data

Clearing Versus Deleting Cells

Clearing and deleting cells produce different results for formulas that reference those cells. If a cell is cleared, its value is zero; a formula referring to that cell will get a value of zero from that cell. If a cell is deleted, it no longer exists; a formula referring to the deleted cell will not be able to find it and will return the error value #REF!.

This difference is significant, because clearing a cell when you mean to delete it might produce erroneous data. For example, you might have a formula that gives you an average of the values in a group of cells. If you clear half of those cells, they will contain a value of zero, but are still counted as part of the average. If you delete the cells, the formula that gives you the average displays the error value #REF! to let you know that you have to adjust your formula.

Important You should always use caution when deleting cells. However, should you inadvertently delete cells you want to keep, you can put them back by immediately choosing the Edit Undo command before doing anything else on your worksheet.

Notes that are attached to deleted cells are deleted with the cells. Notes that belong to shifted cells follow the cells to their new locations.

Clearing Data from a Cell or Cell Range

Use the Edit Clear command to clear a cell's contents, format, or note, or all three. A cell's format includes number format, alignment, protection, or borders you have set with a command from the Format menu.

1. Select the cell or cell range you want to clear.
2. Choose Edit Clear.
3. Select the option you want.
4. Click the OK button.

Tip If you want to clear formulas, values, formats, and notes from an entire worksheet, it's easier to create a new worksheet using the File New command.

Deleting a Cell or Cell Range

Use the Edit Delete command to remove a cell and its contents from the worksheet.

1. Select the cell or cell range you want to delete.
2. Choose Edit Delete.

   If you delete a single cell or a cell range, Microsoft Excel displays a dialog box so you can decide how to shift the remaining cells.
3. Select Shift Cells Left or Shift Cells Up.
4. Click the OK button.

Microsoft Excel deletes the selected cells and shifts the other cells in the worksheet to fill the space.

Deleting Entire Rows or Columns

1. Select the rows or columns you want to delete. (Click or drag in the row or column headings to select entire rows or columns.)
2. Choose Edit Delete.

Microsoft Excel automatically shifts the remaining cells to the left or up to fill the space.

Deleting Data from a Chart

This section presents a brief summary of each procedure for deleting data from a chart. For more information, see the related topics, as indicated.

To delete attached or unattached text in a chart:

1. Click chart text to display the contents in formula bar.
2. Press Backspace and then press Enter.

For the step-by-step procedure, see **Chart text.**

To delete a data series from a chart:

1. Select one of the data series markers to display the series formula in the formula bar.
2. Press Backspace and then press Enter.

For the step-by-step procedure, see **Chart data series.**

Note Deleting a data series from a chart does not delete the source data from the worksheet. However, deleting the source cells of the data series from the worksheet also deletes the data series from the chart and closes up the space along the category axis occupied by the data series markers. Clearing the source cells clears the data series from the chart, but does not close up the space occupied by the data series markers along the category axis.

Deleting Other Types of Data

This section presents a brief summary of each procedure for deleting other types of data. For more information, see the related topics, as indicated.

To delete a document (full menus only):

1. Choose File Delete.
2. Select the document in the list box.
3. Click the OK button.

For the step-by-step procedure, see **Deleting a document.**

To delete a name:

1. Choose Formula Define Name.
2. Select the name in the list box.
3. Click the Delete button.

For the step-by-step procedure, see **Names.**

To delete a cell note:

1. Choose Formula Note.
2. Select the note in the list box.
3. Click the Delete button.

For the step-by-step procedure, see **Notes.**

To delete a custom number format:

1. Choose Format Number.
2. Select the number format in the list box.
3. Click the Delete button.

For the step-by-step procedure, see **Number.**

Related Information

Reference

For information on	See
Editing, formatting, or deleting documents	Editing a document Formatting a document Deleting a document
Editing text in a chart	Chart text
Chart data series	Chart data series
Using names and notes	Names Notes

Display options

The Microsoft Excel display options include techniques for streamlining analysis or enhancing the onscreen appearance of worksheets, especially for presentations. These options simplify tasks involving large worksheets.

This topic explains:

- Worksheet display options

  Displaying formulas or values
  Hiding or displaying zero values
  Hiding or displaying gridlines
  Hiding or displaying row and column headings
  Changing the color of gridlines and headings

- Workspace display options

  Displaying R1C1 or A1 reference style
  Hiding or displaying scroll bars
  Hiding or displaying the formula bar
  Hiding or displaying the status bar

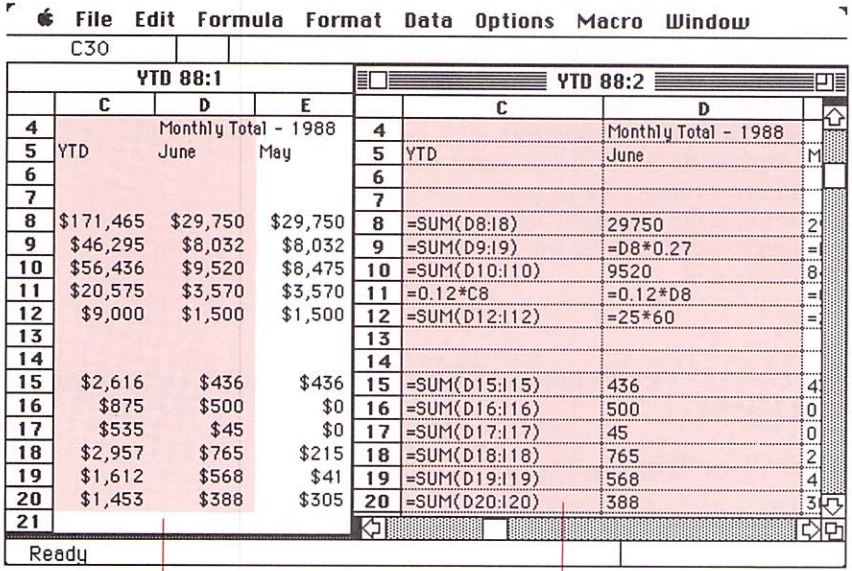
This topic does not explain how to open multiple windows into a document, split windows, or freeze titles in a window. For information on these subjects, see **Windows.**

Note All worksheet display options also apply to macro sheets.

Worksheet Display Options

For each worksheet window, you can set any of the display formats discussed in this section. This means that you can use different display formats for each of several windows for a single worksheet.

The following illustration shows two windows for the same worksheet, each with different display options set:



Displaying Formulas or Values

When you first open a new worksheet window, Microsoft Excel automatically displays values in the worksheet cells. If a cell value is the result of a formula, you see the formula only when you select the cell which displays the formula in the formula bar.

You can change the worksheet window so that cell formulas instead of values are displayed throughout the worksheet. This option is useful for creating templates or debugging a worksheet model.

A new macro sheet automatically displays formulas in cells. You can also change this default and display values instead.

Note Formulas are always displayed left-aligned. Any special alignment formats you've set with the Format Alignment command appear only when you display values. For more information on aligning worksheet entries, see **Alignment.**

To display formulas	To display values
1 Choose Options Display. 2 Turn on the Formulas check box. 3 Click the OK button. Microsoft Excel doubles the widths of all columns and displays all cell formulas on the worksheet. If a formula is too long, Microsoft Excel displays as much as will fit in the cell.	1 Choose Options Display. 2 Turn off the Formulas check box. 3 Click the OK button.

For more information on macro sheets, see *Microsoft Excel Functions and Macros.*

Hiding or Displaying Zero Values

In each worksheet window, you can specify whether or not you want cell values equal to zero to be hidden or displayed. Hiding zero values keeps the worksheet from appearing cluttered with cells that contain only zeros.

Important Because cells with hidden zero values appear to be empty, it's very easy to inadvertently replace them with other cell entries. To avoid potential errors, you should lock the cells with the Format Cell Protection and Options Protect Document commands. For more information, see **Protecting or hiding data.**

To hide zero values:

1 Choose Options Display.
2 Turn off the Zero Values check box.
3 Click the OK button.

To display hidden zero values:

1 Choose Options Display.
2 Turn on the Zero Values check box.
3 Click the OK button.

Note The Zero Values setting will not take effect in cells already formatted with the Format Number command to display an explicit value for zeros — for example, 0.00 ;(0.00);0. The Format Number setting overrides the Options Display Zero Values setting. For more information on number formats, see **Number.**

Hiding or Displaying Gridlines

To make worksheet formats such as borders and shading stand out, you can hide the gridlines.

1. Choose Options Display.
2. Turn off the Gridlines check box.
3. Click the OK button.

To display hidden gridlines:

1. Choose Options Display.
2. Turn on the Gridlines check box.
3. Click the OK button.

Note To hide or show gridlines when printing a worksheet, you use a separate setting in the File Page Setup command.

Hiding or Displaying Row and Column Headings

You can hide the column and row headings (letters and numbers in A1 format; numbers in R1C1 format) usually displayed at the top and left edges of the worksheet window.

1. Choose Options Display.
2. Turn off the Row and Column Headings check box.
3. Click the OK button.

To display hidden row and column headings:

1. Choose Options Display.
2. Turn on the Row and Column Headings check box.
3. Click the OK button.

Note To hide or show column and row headings when printing a worksheet, you use a separate setting in the File Page Setup command.

Changing the Color of Gridlines and Headings

If you are using a color monitor, you can specify a color for gridlines and row and column headings in each worksheet window. This makes it easy to identify different worksheets (or multiple windows for one worksheet) if you're working with several documents.

1. Choose Options Display.
2. In the Gridline and Heading Color box, select the color you want.
3. Click the OK button.

   Repeat steps 1–3 for each window you want to format.

Workspace Display Options

With the Options Workspace command, you can set display options that affect the Microsoft Excel window globally and not just separate worksheet windows. These options also remain in effect when a chart window is selected.

Displaying R1C1 or A1 Reference Style

Initially, Microsoft Excel uses the A1 reference style, which displays letters in the column headings and numbers in the row headings. In the A1 reference style, cell references in formulas are designated by a column letter and a row number, for example, C10. You can change the reference style to "R1C1," which uses numbers for both the row and column headings. Cell references are then referred to by a row number and a column number, for example, cell C10 would be R10C3 in the R1C1 reference style. Microsoft Excel automatically changes cell references in formulas to match the reference style you choose to display.

To display R1C1 reference style

1. Choose Options Workspace.
2. Turn on the R1C1 check box.
3. Click the OK button.

To display A1 reference style

1. Choose Options Workspace.
2. Turn off the R1C1 check box.
3. Click the OK button.

Hiding or Displaying Scroll Bars

You can hide the scroll bars so that they will not display in the active window. When the scroll bars are hidden you can still use the extended keyboard scrolling commands to scroll the window. For information on scrolling, selecting, and moving with the keyboard, see **Keyboard.**

1. Choose Options Workspace.
2. Turn off the Scroll Bars check box.
3. Click the OK button.

To display scroll bars:

1. Choose Options Workspace.
2. Turn on the Scroll Bars check box.
3. Click the OK button.

Hiding or Displaying the Formula Bar

You can hide the formula bar to increase the area in which you can display your documents.

1. Choose Options Workspace.
2. Turn off the Formula Bar check box.
3. Click the OK button.

To display the formula bar:

1. Choose Options Workspace.
2. Turn on the Formula Bar check box.
3. Click the OK button.

Hiding or Displaying the Status Bar

The **status bar** is the area at the bottom of the screen that displays the current status and other information as you perform operations in Microsoft Excel. You can hide the status bar to allow more room for displaying your documents.

1. Choose Options Workspace.
2. Turn off the Status Bar check box.
3. Click the OK button.

To display the status bar:

1. Choose Options Workspace.
2. Turn on the Status Bar check box.
3. Click the OK button.

Related Information

Reference

For information on	See
Formatting worksheets, including display formats (general overview)	Formatting a document
Aligning cell entries in worksheets	Alignment
Using borders and shading in worksheets	Borders and shading
Displaying short or full menus	Command, menu, and dialog box
Using the R1C1 reference style	References
Color display options	Color
Keyboard commands for working in windows	Keyboard Windows

Sampler

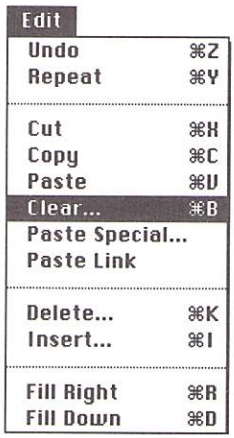
Calculating a Sales Commission

Divergence

During iteration — a process of automatically repeating calculations to resolve circular references — **divergence** occurs when the difference between results from one calculation to the next becomes larger and larger. When this happens, Microsoft Excel continues to iterate until it completes the maximum number of iterations you specified in the Options Calculation dialog box, or until you press Command+. (period) to cancel iteration. For more information, see **Iteration** and **Convergence.**

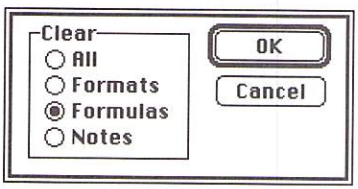
Edit Clear command

Removes data, formats, or both from the selected cells in the active document. Edit Clear works differently when a worksheet or macro sheet is the active document from when a chart is the active document.



Worksheet

When a worksheet or macro sheet is the active document, Edit Clear clears the contents, formats, notes, or all three from the selected cells. If the formula bar is active, Edit Clear clears only the part of the formula that is selected.



Clear

All	Clears the contents, formats, and notes from the selected cells. The cells become blank and return to General format.
Formats	Clears the formats of the selected cells, but leaves the contents and notes intact. The cells return to General format.
Formulas	Clears cell contents from the selected cells without affecting the formats or notes.
Notes	Clears the notes from the selected cells, but leaves the contents and formats intact.

Clearing Versus Deleting

Important Edit Clear removes the contents of the selected cells; the Edit Delete command removes not only the contents, but also the cells themselves. This difference is important when other cells have formulas that refer to the cleared or deleted cells.

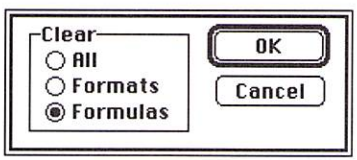
A formula containing a reference to a cleared cell assumes that the cleared cell has a value of zero. A formula containing a reference to a deleted cell is unable to find the deleted cell and displays the #REF! error value.

For example, if you have a formula that calculates the average of the values in a group of cells, and you clear half of the cells, the formula still calculates an average of all of those cells, even though half of them now have a zero value. If the same cells were deleted, the formula would produce the #REF! error value to let you know that you should change the formula to refer only to the cells you want to average.

Chart

When a chart is the active document, and the entire chart has been selected with the Chart Select Chart command, Edit Clear clears the chart's data series, format, or both.

If the formula bar is active, Edit Clear clears only the part of the formula that is selected.



Clear

All	Clears all data series and the chart format.
Formats	Clears the chart format without affecting the data series. The chart is reformatted with format 1 from the Gallery Column dialog box.
Formulas	Clears all data series from the chart without affecting the chart format.

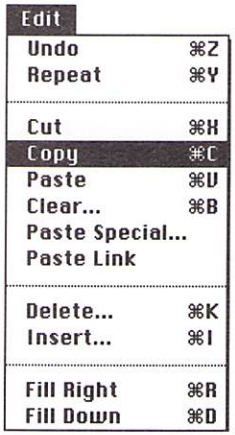
For more information, see **Formatting a document.**

Edit Copy command

Defines the selection that will be copied when you choose the Edit Paste or Edit Paste Special command. The selection can be cells on a worksheet, an entire chart, or characters in the formula bar of a worksheet or chart.

When you choose Edit Copy while the formula bar is active, Microsoft Excel puts a copy of the selected characters into the Clipboard, replacing the Clipboard's contents. After you copy a selection, you can use the Edit Paste command to paste it in the formula bar at the insertion point.

You can also copy a picture of the data rather than the data itself. For more information, see **Edit Copy Picture command.**



Worksheet

You can copy cells from the worksheet or characters from the formula bar.

To copy cells, select the cell range you want to copy. The selection must be a single, continuous rectangular area. When you choose Edit Copy, Microsoft Excel outlines the selection with a marquee.

After you copy a cell range, you can use the Edit Paste or Edit Paste Special command to paste the copied data into other cells on the worksheet or to another worksheet, or create a data series in a chart. For information on pasting copied data, see **Edit Paste command** and **Edit Paste Special command.**

If you move to a different application after choosing Edit Copy, the selection with the marquee is copied to the Clipboard. You can then paste the data from the Clipboard into the other application. For more information, see **Exchanging data between applications.**

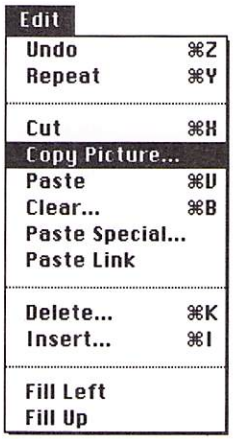
Chart

You can copy the data series and format of the whole chart, or characters from the formula bar.

To copy a chart to another chart, choose Edit Copy, activate the chart you want to copy to, and use the Edit Paste or Edit Paste Special command to paste the copied chart.

For more information on commands and procedures for copying a chart, see **Copying data and formats.** For more information on charts, see **Chart.**

Edit Copy Picture command

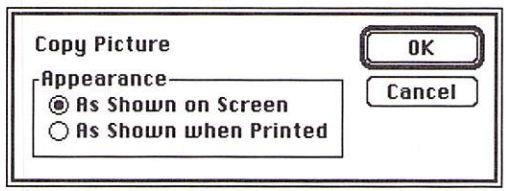


Copies a picture of the current selection to the Clipboard. From the Clipboard, you can paste the copied picture into another application. For example, you can paste a picture of a chart or part of a worksheet into a report you are creating in a word processor.

Copy Picture appears on the Edit menu only if you hold down Shift when you select the Edit menu. Copy Picture appears in place of the Copy command. For information on shifted commands, see **Command, menu, and dialog box.**

Worksheet

Edit Copy Picture copies a picture of the selected part of the worksheet. When you copy the selection, you can choose how you want it copied.

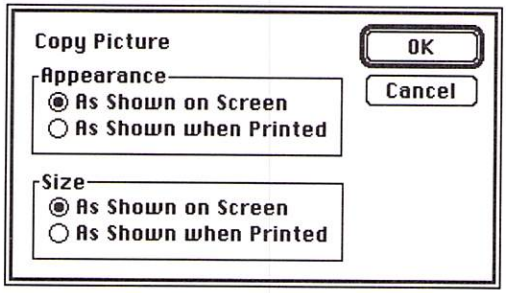


Appearance

As Shown On Screen	Copies exactly what you see on the screen. If you paste the picture into another document, when you print that document the picture may appear different than if you were to print it directly from Microsoft Excel.
As Shown When Printed	Copies what you would see if you printed the selection. The picture varies depending on what kind of printer you are using.

Chart

When you copy a picture of a chart, you can control both its appearance and its size.



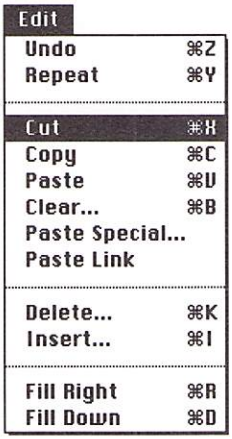
Appearance

As Shown On Screen	Copies exactly what you see on the screen. If you paste the picture into another document, when you print that document the picture may appear different than if you were to print it directly from Microsoft Excel.
As Shown When Printed	Copies what you would see if you printed the chart. The picture varies depending on what kind of printer you are using.

Size

As Shown On Screen	Copies the picture in the size of the window in which the chart is displayed. You can change the size of the picture by changing the size of the window before copying.
As Shown When Printed	Copies what you would see if you printed the chart. The picture varies depending on the shape of the window, the kind of printer you are using, and the Size setting in the File Page Setup dialog box.

Edit Cut command



Defines the selection that will be moved when you choose the Edit Paste command. The selection can be cells on a worksheet, or characters in the formula bar of a worksheet or chart. If you want to use the Edit Paste Special command, you must precede it with the Edit Copy command.

When you choose Edit Cut while the formula bar is active, Microsoft Excel removes the selected characters from the formula and puts them on the Clipboard, replacing the Clipboard's contents. You can then use the Edit Paste command to paste the selection in the formula bar at the insertion point.

Worksheet

You can cut cells from the worksheet or characters from the formula bar.

To move cells, select the cell range you want to move. The selection must be a single, continuous rectangular area. When you choose Edit Cut, Microsoft Excel outlines the selection with a marquee, but does not move it until you choose the Edit Paste command.

Important Edit Cut and Edit Delete affect cells differently. Edit Cut is the first step in moving the contents and formats of cells to another part of the worksheet or to a different worksheet. Edit Delete completely removes cells from the worksheet and closes up the space they occupied. You cannot paste deleted cells.

For more information, see **Moving data on a worksheet.**

Chart

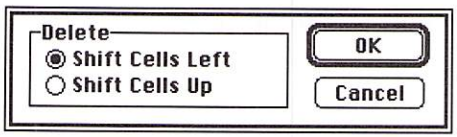
In a chart, Edit Cut works only on characters in the formula bar. You cannot cut objects from a chart.

For more information, see **Moving data on a worksheet** and **Chart.**

Edit Delete command

Removes the selected cells from the worksheet and shifts other cells to close up the space.

When you delete entire rows or columns, there is only one direction in which to shift the remaining cells, so Edit Delete does it automatically. When you delete a selection smaller than an entire row or column, a dialog box appears:



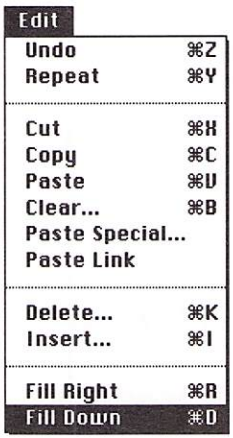
Delete

Shift Cells Left	Shifts the cells from the right of the selection into the deleted area
Shift Cells Up	Shifts the cells from below the selection into the deleted area

Important Edit Delete completely removes the selected cells. If you only want to clear the contents or formats, use the Edit Clear command. For more information, see "Clearing Versus Deleting" under **Edit Clear command.**

For more information on deleting cells, see **Deleting and clearing data.**

Edit Fill Down command



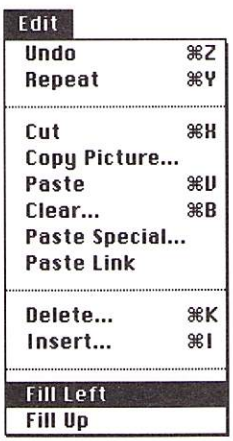
Copies the contents and formats of the cells in the top row of a selection into the rest of the rows in the selection. Any contents or formats in the filled rows are completely replaced.

If you have a multiple selection, each range in the selection is filled separately with the contents of the top row of each range.

If you hold down Shift when you select the Edit menu, this command is replaced with the Edit Fill Up command.

For more information, see **Copying data and formats.**

Edit Fill Left command



Copies the contents and formats of the cells in the right column of a selection into the rest of the columns in the selection. Any contents or formats in the filled columns are completely replaced.

If you have a multiple selection, each range in the selection is filled separately with the contents of the right column of each range.

If you hold down Shift when you select the Edit menu, Edit Fill Left appears in place of the Edit Fill Right command.

For more information, see **Copying data and formats.**

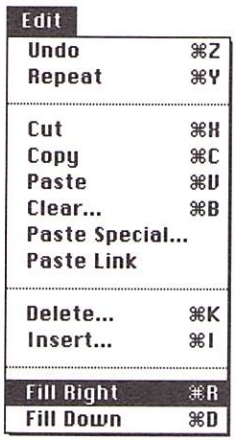
Edit Fill Right command

Copies the contents and formats of the cells in the left column of a selection into the rest of the columns in the selection. Any contents or formats in the filled columns are completely replaced.

If you have a multiple selection, each range in the selection is filled separately with the contents of the left column of each range.

If you hold down Shift when you select the Edit menu, this command is replaced with the Edit Fill Left command.

For more information, see **Copying data and formats.**



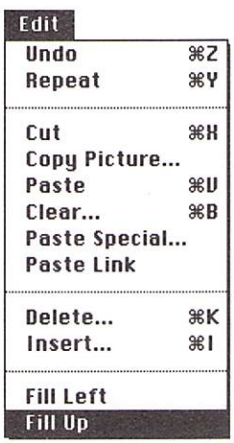
Edit Fill Up command

Copies the contents and formats of the cells in the bottom row of a selection into the rest of the rows in the selection. Any contents or formats in the filled rows are completely replaced.

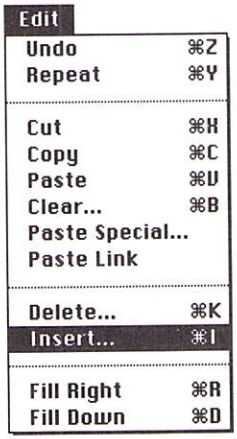
If you have a multiple selection, each range in the selection is filled separately with the contents of the bottom row of each range.

If you hold down Shift when you select the Edit menu, Fill Up appears in place of the Edit Fill Down command.

For more information, see **Copying data and formats.**

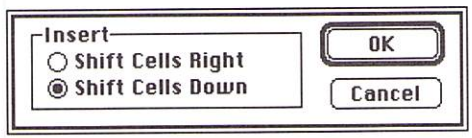


Edit Insert command



Inserts a blank cell or range of cells into the worksheet and shifts the selected cells to accommodate the new ones. Edit Insert always inserts a cell range equal in size and shape to the selected cell range.

When you insert entire rows or columns, there is only one direction in which to shift the other cells in the worksheet, so Edit Insert does it automatically. When you insert a range of cells smaller than a row or column, a dialog box appears:



Insert

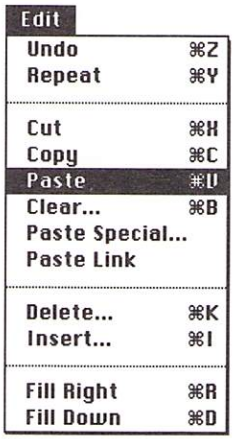
Shift Cells Right	Shifts the selected cells to the right to accommodate the new cells
Shift Cells Down	Shifts the selected cells down to accommodate the new cells

For more information, see **Inserting blank cells.**

Edit Paste command

Pastes a selection that you defined with the Edit Copy or Edit Cut command.

After you cut or copy cells from a worksheet or copy data from a chart, you can also paste the data by pressing the Enter key. If you use Enter instead of Edit Paste, Microsoft Excel pastes the data and cancels the marquee. Do not use Enter if you want to paste multiple copies.



Worksheet

In a worksheet, Edit Paste puts the contents and formats of the copied or cut cells into the currently selected cells. If there is data already in those cells, the data is replaced with the pasted data. The paste area can be a single cell or a range of cells. If the paste area is a single cell, Microsoft Excel matches it to the upper-left cell of the copy or cut area, and fills the rest of the range downward and to the right.

Note If you choose the Edit Cut command before pasting, the paste area must be a single cell or a range the same size as the cut area. If you choose the Edit Copy command before pasting, you can vary the size of the paste area to paste multiple copies.

If you copied data from another application or another document to the Clipboard, Edit Paste pastes that data into your document.

If the formula bar is active, Edit Paste inserts the contents of the Clipboard into the formula bar at the insertion point. If any characters in the formula bar are selected, Edit Paste replaces them with the contents of the Clipboard.

Pasting Multiple Copies

If you choose the Edit Copy command before you paste, you can paste multiple copies, either simultaneously or sequentially. You cannot paste multiple copies sequentially after choosing Edit Cut.

If you want to paste multiple copies simultaneously, the cell range of the paste area can be a single or multiple selection, and must be able to contain two or more rectangles of the same size and shape as the copy area. When you paste, Microsoft Excel duplicates the copy area to fill the paste area.

To paste multiple copies sequentially, you don't have to choose the Edit Copy command each time you paste. Continue to select paste areas and choose Edit Paste until you have pasted the copy area everywhere you want. You can continue to paste the copy area until you choose another command or cancel the copy marquee with Command+. (period).

Edit Paste pastes all cell properties for every cell pasted, including cell contents, number format, borders, font, alignment, protection status, and notes. If you want to paste only certain cell properties, use the Edit Paste Special command.

To copy the contents of cells and formats in a single row or column to adjoining cells, use the Edit Fill Down, Edit Fill Up, Edit Fill Right, or Edit Fill Left command.

For more information, see **Copying data and formats.**

Chart

When a chart is active, Edit Paste creates data series from copied worksheet cells and pastes them into the active chart, or pastes the data series and formats from a copied chart into the active chart. If you are working in the formula bar, Edit Paste pastes cut or copied characters at the insertion point, or replaces selected characters with the cut or copied characters.

Pasting from a Worksheet

To paste information from a worksheet, select and copy the cells, create a new chart or activate an existing chart, and choose Edit Paste. Microsoft Excel automatically creates data series and pastes them into the active chart. For information on how Microsoft Excel organizes data series, see **Chart data series.** For information on controlling how Microsoft Excel divides the copied selection into series and categories, see **Chart data series** and **Edit Paste Special command.**

Pasting from a Chart

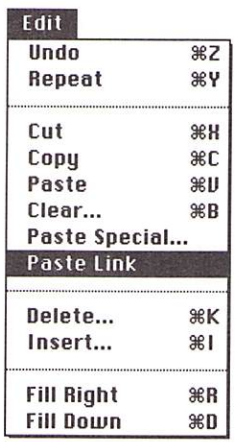
To paste information from another chart, copy the chart with the Edit Copy command, create a new chart or activate an existing chart, and then choose Edit Paste.

When Microsoft Excel pastes a copied chart, it adds the data series to any series already in the active chart and replaces the format of the active chart with the format of the copied chart. If you want to paste only the format or only the data series of a copied chart, use the Edit Paste Special command.

Edit Paste Link command

(Full Menus)

Pastes copied data into the cells in the current selection and establishes a link with the source of the data. When the source data changes, your worksheet reflects those changes. The source of the data can be another Microsoft Excel worksheet or another application.



Note If you paste a selection that contains more than one cell, Edit Paste Link pastes an array. The formulas in an array cannot be changed individually. If you do not want the link to be part of an array, create the link by typing the remote reference directly into the formula. For more information on arrays, see **Array.** For more information on creating links, see **Linking documents.**

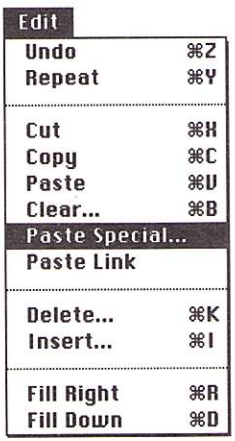
To paste a link, first copy the source data; then select the cell or cell range where you want to paste the data and choose Edit Paste Link. If the source of the data is another Microsoft Excel worksheet, the source must be a continuous cell range.

The paste area can be a single cell or a cell range. If the paste area is a single cell, and the copy area is from another Microsoft Excel worksheet, Microsoft Excel matches the upper-left cell of the copy area to the single cell and fills the rest of the range downward and to the right.

If the paste area is a cell range, the paste area must be able to contain one or more rectangles of exactly the same size and shape as the copy area. If the paste area contains two or more rectangles the size and shape of the copy area, Microsoft Excel duplicates the copy area to fill the paste area.

Edit Paste Special command

(Full Menus)



Pastes selected parts of the copy area into the cells in the current selection. You select what parts Microsoft Excel pastes, and how they are pasted. For example, you can paste just the values from the copy area and have Microsoft Excel add those values to the values in the paste area.

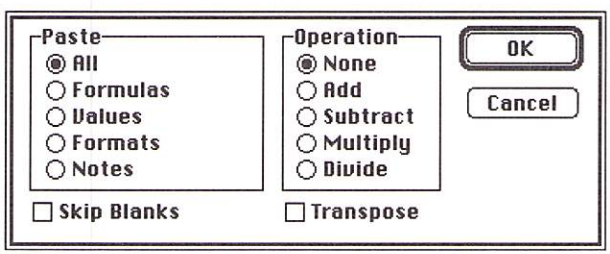
You must use the Edit Copy command before Edit Paste Special. Edit Paste Special does not work when preceded by the Edit Cut command.

For information on copying data, see **Copying data and formats.**

Worksheet

The paste area can be a single cell, a cell range, or a multiple selection. If the paste area is a single cell, Microsoft Excel matches the upper-left cell of the copy area to the single cell, and fills the rest of the range downward and to the right.

If the paste area is a cell range or multiple selection, each selection in the paste area must be able to contain one or more rectangles of exactly the same size and shape as the copy area. If the paste area contains two or more rectangles the size and shape of the copy area, Microsoft Excel duplicates the copy area to fill the paste area.



Paste

All	Pastes all cell properties
Formulas	Pastes only the contents in the cells as entered in the formula bar
Values	Pastes only the values as displayed in the cells
Formats	Pastes only the formats of the cells
Notes	Pastes only the notes attached to the cells

Operation

None	Completely replaces the cells in the paste area with the cells in the copy area. Pasting all parts with None selected under Operation is the same as choosing the Edit Paste command.
Add	Adds the specified parts of the copy area cells to the paste area cells.
Subtract	Subtracts the specified parts of the copy area cells from the paste area cells.
Multiply	Multiplies the paste area cells by the specified parts of the copy area cells.
Divide	Divides the paste area cells by the specified parts of the copy area cells.

Skip Blanks Microsoft Excel normally pastes any blank cells in the copy area onto the paste area. Turn on this option if you want Microsoft Excel to skip blank cells in the copy area when pasting.

Transpose Switches the orientation of the data when you paste it. The data that was in the top row of the copied area appears in the left column, and the data that was in the left column appears along the top row.

Chart

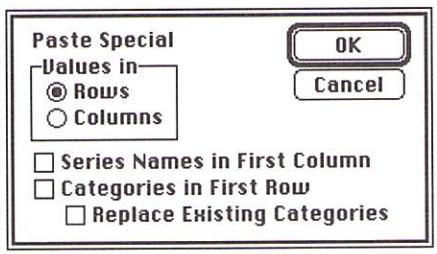
When a chart is active, Edit Paste Special creates data series from copied worksheet cells and pastes them into the active chart, or copies the data series and formats from another chart and pastes them into the active chart.

Edit Paste Special is different from Edit Paste because it lets you control how Microsoft Excel organizes a worksheet selection into data series.

For information on how Microsoft Excel defines data series, see **Chart data series.**

Pasting from a Worksheet

To paste information from a worksheet, select and copy the cells, create a new chart or activate an existing chart, and choose Edit Paste Special. Microsoft Excel displays a dialog box so you can define how you want the data in the worksheet selection added to the chart. The first two check boxes in the dialog box change according to what you select in the Values In box.



Values In

Rows	Contents of each row in the copied selection become a data series.
Columns	Contents of each column in the copied selection become a data series.

Series Names in First Column When you turn on this check box, Microsoft Excel uses the contents of the cell in the first column of each row in the selection as the name of the data series in that row. If this check box is turned off, Microsoft Excel uses the contents of the cell in the first column of each row as the first data point of the data series.

Categories in First Row When you turn on this check box, Microsoft Excel uses the contents of the first row of the selection as the categories for the chart. If this check box is turned off, Microsoft Excel uses the contents of the first row as the first data series in the chart.

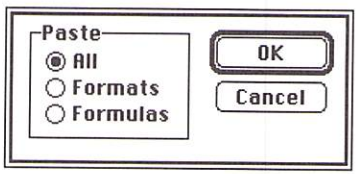
Series Names in First Row When you turn on this check box, Microsoft Excel uses the contents of the cell in the first row of each column in the selection as the name of the data series in that column. If this check box is turned off, Microsoft Excel uses the contents of the cell in the first row of each column as the first data point of the data series.

Categories in First Column When you turn on this check box, Microsoft Excel uses the contents of the first column of the selection as the categories for the chart. If this check box is turned off, Microsoft Excel uses the contents of the first data series in the chart.

Replace Existing Categories Uses the categories from the copied cell range for the data series already in the chart, as well as for the data series you are pasting. If you turn on this check box, the existing categories are completely replaced. Microsoft Excel asks you to confirm the loss of those categories.

Pasting from Another Chart

To paste the data series, format, or both from another chart, copy the chart with the Edit Copy command; then create a new chart or activate an existing chart and choose Edit Paste Special. Microsoft Excel displays the following dialog box when you are pasting a copied chart:



All Select this option to paste the data series and the format of the copied chart. Microsoft Excel adds all the data series from the copied chart to any data series already on the active chart.

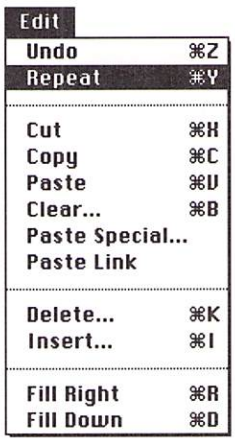
Important If you paste with this option selected, the format of the copied chart completely replaces the format of the active chart.

Formats Select this option to replace the format of the active chart with the format of the chart you copied. This option does not affect the data in the chart you are pasting into.

Formulas Select this option to add the data series from the copied chart to any data series already in the active chart. This option does not change the format of the chart you are pasting into.

Edit Repeat command

(Full Menus)



Repeats the last command you chose, if possible, including any options you changed in the dialog box.

Edit Repeat is especially useful for repeating actions, such as applying the same formats to different groups of cells.

Edit Repeat only works for commands that can reasonably be repeated. It would not be possible, for example, to repeat the File Close All command, because there would be no open windows to close.

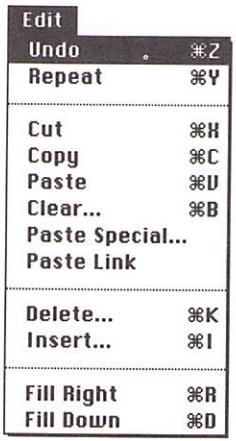
Edit Undo command

Reverses certain commands or actions, for example:

- Typing in the formula bar after you enter a formula or value in a cell (worksheet only)
- All commands on the Edit menu (worksheets and charts)
- These worksheet commands:

  Formula Apply Names (full menus)
  Formula Replace (full menus)
  Format Justify (full menus)
  Data Parse (full menus)
  Data Sort

- Paste List in the Formula Paste Name dialog box



Note

- You cannot undo the File Delete, Data Delete, or Data Extract commands.
- You can only undo the last command you chose or the last cell entry you typed.

Editing a document

Editing typically involves revising a document to fine-tune its accuracy, content, or organization. This topic presents a brief summary of each procedure and option you can use for editing worksheets, macro sheets, and charts in Microsoft Excel.

This topic explains:

- Undoing and repeating a command

  Undoing a command
  Repeating a command

- Editing a worksheet

  Worksheet editing reminders
  Display adjustments that simplify editing
  Editing in the formula bar
  Copying and moving data and formats
  Finding cells and replacing data quickly
  Editing rows and columns
  Deleting and clearing data and formats

- Editing in a chart

  Editing chart text
  Editing a series formula

Note All worksheet editing procedures also apply to macro sheets.

Undoing and Repeating a Command

The editing basics in this section apply to both worksheets and charts.

Undoing a Command

If you change your mind or make a mistake while working on a document, you can choose the Edit Undo command to reverse certain commands and actions immediately after you complete them. For a list of commands and actions that you can reverse, see **Edit Undo command.**

The Edit Undo command changes to reflect the most recent command or action that is affected by Edit Undo. If Edit Undo does not apply, the words "Can't Undo" appear grayed on the menu.

To undo a command or action:

▣ Choose Edit Undo.
Microsoft Excel changes the command name displayed on the Edit menu to Redo. If you want to reverse the Undo command, choose Edit Redo.

Repeating a Command

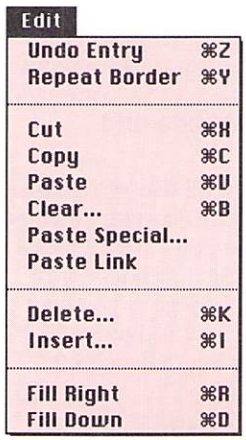
The Edit Repeat command is available for any command that can be repeated. Whenever the Edit Repeat command does not apply, "Can't Repeat" appears grayed on the menu.

To repeat a command:

- Choose Edit Repeat.

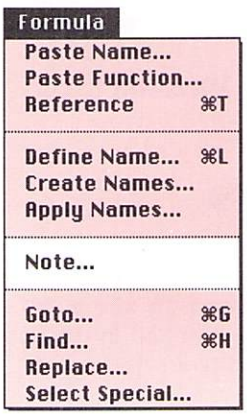
Editing a Worksheet

The worksheet editing commands are on the Edit and Formula menus (full menus shown).



The Edit menu includes commands to:

- Undo or repeat commands and actions
- Move, copy, and link data
- Insert or delete rows and columns and fill a range with a value or formula
- Clear formats, formulas, or notes from cells



The Formula menu includes commands to:

- Simplify the editing of complex formulas
- Create and use names for cells and ranges
- Find specific cells and data quickly or search for and replace information

For information on each command, see the topic of the same name.

Worksheet Editing Reminders

- **"Copy area," "cut area," and "paste area" are key terms that apply to copy and move procedures.** "Copy area" refers to cells you want to copy, while "cut area" refers to cells you want to move. "Paste area" refers to the section of the worksheet to which you are copying or moving cells.
- **In a copy operation with the Edit Copy and Edit Paste commands, Microsoft Excel adjusts relative references and the relative portions of mixed references.** In the paste area, Microsoft Excel adjusts references so that they refer to cells in the same relative position as they did in the copy area. Absolute references are unaffected by a copy operation. For more information on how copying or transposing the selection with the Edit Paste Special command affects relative and mixed references, see **Copying data and formats.**
- **When you move cells (cut cells from one part of the worksheet and paste them in another), Microsoft Excel adjusts references.** Relative, mixed, and absolute references *to* moved cells are adjusted so they refer to the new location of the moved cells. Relative and mixed references *in* moved cells are adjusted so they refer to the same cells as before the move. Absolute references *in* moved cells are unaffected. For more information on how moving cells affects references, see **Moving data on a worksheet.**
- **Microsoft Excel replaces the contents of any existing cells in the paste area when you paste copied or cut cells into that area.** Before you paste copied or cut cells with the Edit Paste command, make sure the paste area doesn't include cell entries you want to keep.
- **When you insert or delete rows or columns, Microsoft Excel adjusts all references in formulas.**

Display Adjustments that Simplify Editing

With Microsoft Excel you can open and view several documents on the screen at one time. This is particularly helpful for cross-checking between documents as you edit. Just arrange your screen by sizing and moving the document windows with the procedures outlined in this section. Use the Window Arrange All command to see all your document windows simultaneously.

When revising a large worksheet, you might want to try the freeze titles, multiple windows, and panes options outlined below. These simplify editing tasks such as entering new data into long rows or columns, and copying or moving data between widely separated parts of the document.

To view and edit different parts of a worksheet using multiple windows:

- Choose Window New Window; if you want, size the windows separately and scroll them to different parts of the worksheet.
- For step-by-step procedures, see **Windows.**

To view and edit different parts of a worksheet using panes:

- Drag the vertical or horizontal split bar to where you want the split.
- For step-by-step procedures, see **Windows.**

To freeze column and/or row titles on the display (full menus):

- Split the window into panes (see the preceding procedure) along right and/or bottom edge of cells with titles you want to freeze; choose Options Freeze Panes.
- For step-by-step procedures, see **Windows.**

Editing in the Formula Bar

You edit worksheet cells in the formula bar. Selecting a cell displays its contents in the formula bar. When editing in the formula bar, you can type changes directly or use commands on the Edit and Formula menus. While the formula bar is active, you can also use the Formula Goto command to find a specific cell.

To edit the contents of a cell:

- Select the cell; then click in the formula bar where you want the insertion point. Make the change, and press Enter (or click the enter box). Using the keyboard, you can press Command+U to activate the formula, and then use the Direction keys to position the insertion point. Make the changes, and press Enter (or click the enter box).
- For step-by-step procedures, see **Formula bar.**

Note Use the preceding instructions to first activate the formula bar and position the insertion point for the edit when performing any of the following formula bar procedures in this section.

To insert a cell reference into a formula:

- Place insertion point in formula bar following an operator, comma, or left parenthesis; click the cell you want referenced, and then click the enter box.
- For step-by-step procedures, see **Formula bar** and **Formula.**

To paste a function into a formula:

- Position insertion point in formula bar and choose Formula Paste Function; select a function from the list box and click the OK button.
- For step-by-step procedures, see **Function.**

To paste a name into a formula:

- Position the insertion point and choose Formula Paste Name; select a name from the list box and click the OK button.
- For step-by-step procedures, see **Names.**

To copy a sequence of characters:

- Select characters you want to copy, choose Edit Copy, position insertion point, and choose Edit Paste.
- For step-by-step procedures, see **Copying data and formats.**

To change the type of the selected reference(s) in the active formula bar:

- Choose Formula Reference or press Command + T until the reference changes to the type you want: relative, absolute, or mixed reference.
- For step-by-step procedures, see **References.**

To replace all or part of the currently displayed formula with its calculated value:

- Select the part of the formula you want replaced; then choose Options Calculate Now.
- For step-by-step procedures, see **Calculation.**

To clear data from the formula bar:

- Select characters you want to clear; choose Edit Clear.
- For step-by-step procedures, see **Formula bar.**

Copying and Moving Data and Formats

The following procedures apply to copying or moving data and formats within one worksheet or between worksheets.

Tip For the following procedures, select only the top-left cell of the paste area; in this way, you can avoid the error caused when the copy or cut area is a different shape from the paste area.

To copy to another part of a worksheet or to a different worksheet:

- Select the cells to be copied and choose Edit Copy; select the paste area and choose Edit Paste.
- For step-by-step procedures, see **Copying data and formats.**

To copy the same cells to many areas of a worksheet:

- Select the cells to be copied and choose Edit Copy; select the paste areas one at a time and choose Edit Paste for each area.
- For the step-by-step procedure, see **Copying data and formats.**

To copy to adjacent cells (fill):

- Select the cells to be copied and the cells to be filled with copied data; choose Edit Fill Right, Edit Fill Left (shifted command), Edit Fill Down, or Edit Fill Up (shifted command).
- For the step-by-step procedure, see **Copying data and formats.**

To copy specific cell or range attributes (formulas, values, formats, or notes) (full menus):

- Select the copy area, choose Edit Copy, and select the paste area; choose Edit Paste Special, select the cell attribute you want to copy, and click the OK button.
- For the step-by-step procedure, see **Copying data and formats.**

To combine the contents of the copy and paste areas using a specified operator (full menus):

- Select the copy area, choose Edit Copy, and select the paste area; choose Edit Paste Special, select the property to paste from the Paste box, select the operator from the Operation box, and click the OK button.
- For the step-by-step procedure, see **Copying data and formats.**

To move a cell or range to another part of the worksheet or to a different worksheet:

- Select the cells you want to move (the cut area) and choose Edit Cut; select the paste area and choose Edit Paste.
- For the step-by-step procedure, see **Moving data on a worksheet.**

Finding Cells and Replacing Data Quickly

To jump to a specific cell or named range:

- Choose Formula Goto, select a name from the list or type the reference, and click the OK button.
- For the step-by-step procedure, see **Finding cells and data quickly.**

To find cells with specific references or values:

- Choose Formula Find; specify the options you want and click the OK button.
- For the step-by-step procedure, see **Finding cells and data quickly.**

To find cells or formulas of a certain type (full menus):

- Select the search range (select a single cell to search the entire worksheet) and choose Formula Select Special; select the options you want and click the OK button.
- For the step-by-step procedure, see **Finding cells and data quickly.**

To search for and replace a sequence of characters in one or more formulas (full menus):

- Select the search range (select a single cell to search the entire worksheet) and choose Formula Replace; specify the characters to be replaced and the replacement characters, and select search options. Click Replace All to replace all occurrences in the worksheet or Replace to replace just the occurrence in the active cell.
- For the step-by-step procedure, see **Finding cells and data quickly.**

To select cells that are annotated with cell notes (full menus):

- Select a single cell and choose Formula Select Special; click Notes in the dialog box and click the OK button.
- For the step-by-step procedure, see **Notes.**

To see a list of worksheet cells that are annotated with cell notes:

- Choose Formula Note, scroll through the Notes in Sheet box, and click Cancel to close the dialog box.
- For the step-by-step procedure, see **Notes.**

To read a cell note:

- Choose Formula Note; from the Notes in Sheet list box, select the note you want; read the note in the Note text box and click Cancel to close the dialog box when you're finished.
- For the step-by-step procedure, see **Notes.**

To edit a cell note:

- Choose Formula Note and select the note you want to edit from the Notes in Sheet list box; edit the note in the Note text box and click the OK button.
- For step-by-step procedure, see **Notes.**

Editing Rows and Columns

To insert a row or column (or partial row or column):

- Select the area in which you want to insert the row or column and choose Edit Insert. Select an entire row to insert a row above it; select an entire column to insert a column to the left of it. If you are inserting a partial row or column, select the option you want and click the OK button.
- For the step-by-step procedure, see **Inserting blank cells.**

To delete a row or column (or partial row or column):

- Select the area you want to delete and choose Edit Delete; if you are deleting a partial row or column, select the option you want and click the OK button.
- For the step-by-step procedure, see **Deleting and clearing data.**

To create a series of time periods or numbers that increase by a constant amount or factor (full menus):

- Enter the starting value for the series in a cell. In the same row or column select as many cells as you want to fill. Choose Data Series, select the options you want, and click the OK button.
- For the step-by-step procedure, see **Values.**

To divide a column of long text entries into multiple columns (full menus):

- Select the column of text and choose Data Parse.
- For the step-by-step procedure, see **Values.**

Deleting and Clearing Data and Formats

Important Clearing cells erases the contents of the cells but leaves the cleared cells within the structure of the worksheet. Deleting cells removes the cells and their contents from the worksheet, closing up the space occupied by the deleted cells.

Clearing data from a cell and deleting a cell have different consequences for formulas that reference the cell. If a cell is cleared, its value is then zero. A formula referencing that cell will get a value of zero from the cell. If the cell is deleted, it no longer has any value, and any formula referencing the deleted cell will return the error value #REF!.

To clear data and/or formats from cells:

- Select the cells you want to clear and choose Edit Clear; select the options you want and click the OK button.
- For the step-by-step procedure, see **Deleting and clearing data.**

To delete cells and close up space:

- Select the cells you want to delete and choose Edit Delete; select an option to indicate how you want the space to be closed up and click the OK button.
- For the step-by-step procedure, see **Deleting and clearing data.**

Editing in a Chart

You can revise a chart by editing any text on the chart. In addition, by editing the series formulas used to plot the chart, you can control several aspects of the chart, such as plotting order and data series names used in the chart legend.

The chart editing commands are on the Edit menu (full menus shown).

The Edit menu includes commands to:

- Undo or repeat commands and actions
- Move, copy, and clear data

For information on each command, see the topic of the same name (for example, **Edit Copy command**).

Editing Chart Text

Microsoft Excel charts can have two kinds of text. **Attached text** is any label linked to a specific chart object such as an axis label or the chart title. **Unattached text** is any text not linked to a chart object.

To edit attached or unattached text in a chart:

- Select the text to display it in the formula bar; edit the text, using standard procedures for editing in the formula bar, and press Enter or click the enter box.
- For the step-by-step procedure, see **Chart text.**

To delete attached or unattached text in a chart:

- Select the text to display it in the formula bar, press Backspace, and then press Enter or click the enter box.
- For the step-by-step procedure, see **Chart text.**

To edit linked chart text or axis tickmark labels:

- Activate the source worksheet window. Use standard editing procedures in the formula bar to edit cells used for linked chart text or for values and categories in the chart (the basis for axis tickmark labels).
- For more information, see **Chart axis.**

Editing a Series Formula

By editing a series formula, you can control the data series name as it appears on the chart legend, the data series category and value references, and the plot order. You can also delete an entire data series.

To change a data series name:

- Select one of the data series markers to display its series formula in the formula bar; revise the data series name argument, using standard procedures for editing in the formula bar, and press Enter or click the enter box.
- For the step-by-step procedure, see **Series formula.**

To change references for categories or values in a series formula:

- Select one of the data series markers to display its series formula in the formula bar; change the categories and/or values argument using standard procedures for editing in the formula bar, and press Enter or click the enter box.
- For the step-by-step procedure, see **Series formula.**

To change the plot order of data series:

- For each data series, select a marker to display its series formula in the formula bar; change the plot order argument using standard procedures for editing in the formula bar, and press Enter or click the enter box.
- For the step-by-step procedure and an explanation of how Microsoft Excel adjusts plotting order, see **Series formula.**

To delete a data series from a chart:

- Select one of the data series markers to display its series formula in the formula bar, press Backspace, and then press Enter or click the enter box.
- For the step-by-step procedure, see **Chart data series.**

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart
Adding, editing, formatting, and deleting chart text	Chart text
Formatting worksheets and charts	Formatting a document

Error value

Microsoft Excel displays an **error value** in a cell when it cannot properly calculate the formula for that cell. Error values always begin with the number sign (#). The error values are:

- #DIV/0!
- #N/A
- #NAME?
- #NULL!

- #NUM!
- #REF!
- #VALUE!

If a formula includes a reference to a cell that contains an error value, that formula also produces an error value (unless you are using the special worksheet functions ISERR, ISERROR, or ISNA that look for error values). You may have to trace the references back through a series of cells to discover the source of the error.

This topic explains trouble-shooting measures for each type of error value in Microsoft Excel.

Note Even if a worksheet is free of error values, it may contain faulty logic. For information on checking the internal consistency and accuracy of a worksheet, see **Auditing worksheet models.**

#DIV/0!

The #DIV/0! error value means that a formula is trying to divide by zero.

Possible cause	Suggested correction
Using a reference to a blank cell or a cell containing zero as a divisor. (If an operand should be a number but is blank, Microsoft Excel interprets that blank as zero.)	Change the reference or enter a non-zero value in the cell used as a divisor.
Entering a formula that contains an explicit division by 0 (for example, =5/0).	Correct the formula.
Writing a macro using a macro function that returns #DIV/0! in certain situations.	Look up the functions you are using in Chapter 8, "Macro Language Function Directory," in *Microsoft Excel Functions and Macros,* and see if one or more of your functions returns #DIV/0! in certain situations.

#N/A

The #N/A error value stands for "No value is available."

This error value can help you make sure you don't accidentally refer to a blank cell. If there are cells on your worksheet that should contain data, but the data is not available yet, you can enter #N/A in those cells. Formulas that refer to those cells will return #N/A, instead of calculating a value.

Possible cause	Suggested correction
Giving an inappropriate argument for *lookup_value* in the HLOOKUP, LOOKUP, MATCH, or VLOOKUP functions.	Adjust the *lookup_value* argument.
Using an array argument that was expanded.	Change the array argument so that it can be expanded without #N/A, or so that it is the same size as other array arguments. For more information, see **Array.**
Omitting one or more arguments to a function macro. For example, if the function macro Deduct on the macro sheet CALC uses three numbers as arguments, the following formula will return #N/A: =CALC!Deduct(10,D14).	Enter all arguments in the function.
Using a function macro that did not run successfully. For example, if the function macro Deduct contains an error that prevents it from running, any formula using Deduct will return #N/A.	Correct the function macro or don't use it.
Writing a macro using a macro function that returns #N/A in certain situations.	Look up the functions you are using in Chapter 8, "Macro Language Function Directory," in *Microsoft Excel Functions and Macros,* and see if one or more of your functions returns #N/A in certain situations.

#NAME?

The #NAME? error value results when you use a name that Microsoft Excel doesn't recognize.

Possible cause	Suggested correction
Deleting or failing to define the name.	Define the name.
Misspelling the name.	Correct the spelling. You can use the Formula Paste Name command to insert the correct name into the formula.
Misspelling the name of a function.	Correct the spelling. You can use the Formula Paste Function command to insert the correct function name into the formula.
Entering text without double quotation marks in the formula. Microsoft Excel interprets your entry as a name even though you intended it to be text.	Edit the formula to enclose the text in double quotation marks.
Omitting a colon in a range reference. For example, if you enter the formula =SUM(A1D10), Microsoft Excel interprets A1D10 as a name.	Correct the formula, for example, =SUM(A1:D10).

#NULL!

The #NULL! error value means that you specified an intersection of two areas that do not intersect.

Possible cause	Suggested correction
Using an incorrect range operator, or incorrect cell reference.	Use the union operator, the comma (,), if you want to refer to two areas that don't intersect. Or, check for typing errors in the range specification. For more information, see **Operator.**

#NUM!

The #NUM! error value indicates a problem with a number.

Possible cause	Suggested correction
Using an unacceptable argument in a function that requires a numeric argument. For example, using a negative number as an argument in functions that require positive numbers, such as SQRT(−1).	Correct the argument.
Using a worksheet function that iterates, such as IRR or RATE, and the function is unable to find a result that works.	Try using a different starting guess to the function.
Entering a formula that produces a number that is too large or too small to be represented by Microsoft Excel. For information on limits on the size of numbers in Microsoft Excel, see **Number.**	Change the formula so that its result is within the allowed range of numbers.

#REF!

The #REF! error value occurs when you refer to a cell that is not valid.

Possible cause	Suggested correction
Deleting cells that other formulas refer to.	Change the formulas or reinstate the cells on the worksheet.
Closing a supporting worksheet referred to by a complex external reference. For information on simple and complex external reference formulas, see **Linking documents.**	Reopen the worksheet, or change the reference to a simple external reference.
Writing a macro using a macro function that returns #REF! in certain situations.	Look up the functions you are using in Chapter 8, "Macro Language Function Directory," in *Microsoft Excel Functions and Macros,* and see if one or more of your functions returns #REF! in certain situations.

#VALUE!

The #VALUE! error value occurs when you use the wrong type of argument or operand.

Possible cause	Suggested correction
Entering text where a number or logical value is required, and the text can't be translated into the correct data type.	Check the formula or function for the required operand or argument. Check referenced cells for valid values.
Using an invalid matrix in one of the matrix worksheet functions.	Correct the matrix.
Writing a macro using a macro function that returns #VALUE! in certain situations.	Look up the functions you are using in Chapter 8, "Macro Language Function Directory," in *Microsoft Excel Functions and Macros,* and see if one or more of your functions returns #VALUE! in certain situations.

Related Information

Reference

For information on	See
Operators	Operator
External references	Linking documents
Finding error values	Auditing worksheet models Finding cells and data quickly

Functions and Macros

"Data Types" in Chapter 1, "Introduction to Functions"

"Information Functions" in Chapter 2, "Worksheet Function Directory"

"Running a Function Macro" in Chapter 3, "Introduction to Macros"

Exchanging data between applications

There are four ways to exchange data between Microsoft Excel and another application:

- Use the Clipboard to transfer a single item quickly.
- Use the Scrapbook to transfer several items without having to switch between applications to copy each one.
- Save the file in a format that is readable by the other application or open a file in another format.
- Send the file using the Microsoft Mail application.

This topic explains:

- Copying data using the Clipboard or Scrapbook

  Displaying the Clipboard
  Copying data using the Clipboard
  Copying data using the Scrapbook

- Exchanging entire files between applications

  Saving Microsoft Excel files in other formats
  Opening files created in other applications
  Microsoft Word, Microsoft Write, or MacWrite
  Microsoft File
  Microsoft Chart
  Microsoft PowerPoint

Note For information on using Microsoft Mail with Microsoft Excel, see **Microsoft Mail.**

Copying Data Using the Clipboard or Scrapbook

When you cut or copy data in an application, that data is stored on the Clipboard. The cut or copied data remains on the Clipboard until you cut or copy data again, or shut down or restart your Macintosh. To save your cut or copied data permanently, paste it into the Scrapbook desk accessory.

When you are copying Microsoft Excel data to another application, the Edit Cut command is equivalent to the Edit Copy command. When you paste the data in the destination application, Microsoft Excel does not remove the data from the cut worksheet range.

Note If you copy a table from a text-based program, such as a word processor or a terminal program, into Microsoft Excel, you can easily arrange the imported data into columns and rows by using the Data Parse command. For more information, see **Values.**

Displaying the Clipboard

To see what's on the Clipboard:

▣ Choose Window Show Clipboard.

If you cut or copy cells and then look at the Clipboard, you won't see the cells displayed. Instead, you'll see something like "Copy 2R x 3C" or "Cut 4R x 2C." If you paste to another application, the cells you selected will be pasted. The cells aren't displayed on the Clipboard because that enables Microsoft Excel to save time when you move data between documents within Microsoft Excel.

Copying Data Using the Clipboard

Use the following procedure to copy one item between applications quickly.

1. Activate the window containing what you want to copy.
2. Select what you want to copy.

   To select a Microsoft Excel chart, choose Chart Select Chart.
3. Choose Edit Cut or Edit Copy or hold down Shift and choose Edit Copy Picture.

   Choose Edit Copy Picture to copy selected Microsoft Excel worksheet cells as a graphic or to control the appearance and size of a chart when you copy it.

   For information on these commands, see **Edit Cut command, Edit Copy command, Edit Copy Picture command,** or **Copying data and formats.**
4. Start the application you want to copy the selection to, or use MultiFinder to switch to the application.

   For information on using MultiFinder, see the *MultiFinder User's Guide* provided with MultiFinder.
5. Activate or open the window you want to copy to.
6. If necessary, position the insertion point.
7. Choose Edit Paste to paste the information.

Note Data cut or copied to the Clipboard from a Microsoft Excel document is stored in Rich Text Format (RTF) as well as ASCII format, so that when you paste the data into an application that reads RTF, such as Microsoft Word version 4.0 or later, formatting is retained. Microsoft Excel can also read RTF, and thus retain formatting for text transferred in RTF through the Clipboard.

Copying Data Using the Scrapbook

Use the Scrapbook to copy more than one item between applications.

First, paste each item into the Scrapbook:

1. Activate the window containing what you want to copy.
2. Select what you want to copy.

3. Choose Edit Cut or Edit Copy, or hold down Shift and choose Edit Copy Picture.

   Choose Edit Copy Picture to copy selected Microsoft Excel worksheet cells as a graphic or to control the appearance and size of a chart when you copy it.

   For information on these commands, see **Edit Cut command, Edit Copy command, Edit Copy Picture command,** or **Copying data and formats.**

4. Choose Scrapbook from the Apple menu.
5. Choose Edit Paste.
6. Repeat steps 1–5 for each item you want to copy.

Now paste each item from the Scrapbook into the other application:

1. Start the application you want to copy to, or use MultiFinder to switch to the application.

   For information on using MultiFinder, see the *MultiFinder User's Guide* provided with MultiFinder.

2. Choose Scrapbook from the Apple menu.
3. Scroll the Scrapbook until the item you want to move is displayed.
4. Choose Edit Cut or Edit Copy to move the selection to the Clipboard.
5. Close the Scrapbook.
6. Activate the application window into which you want to paste the item.
7. If necessary, position the insertion point.
8. Choose Edit Paste.
9. Repeat steps 2–8 for each item you want to paste.

Exchanging Entire Files Between Applications

You can transfer entire Microsoft Excel files to other applications by saving them in formats that are readable by other applications. Microsoft Excel can also open documents saved in other file formats besides the "Normal" Microsoft Excel format. For information on which formats to use to transfer a Microsoft Excel document to another application, see **File Save As command.** For a list of the formats that Microsoft Excel can open directly, see **File Open command.**

Saving Microsoft Excel Files in Other Formats

1. Choose the File Save As command.
2. Click the Options button.
3. Click an option under File Format.
4. Click the OK button.
5. Optionally, type a new name for the worksheet in the Save Worksheet As text box.

   If you don't type a new name and save the worksheet, Microsoft Excel asks if you want to replace the existing worksheet file. If you click Yes, the Microsoft Excel formatted worksheet is replaced and Microsoft Excel formats for the worksheet may be lost.
6. Click the Save button.

Opening Files Created in Other Applications

To open a file that is in another format, readable by Microsoft Excel, simply open the file using the File Open command. All files that are readable by Microsoft Excel are listed in the File Open dialog box.

If you select a text file in the File Open dialog box, click the Text button to display a dialog box in which you can specify whether tab characters or commas are used to separate the data into cells. You can also use the Data Parse command to separate the data after it has been imported into Microsoft Excel.

Important The opened file is not converted to Microsoft Excel format but remains in the original format until you use the File Save As command to save it as a "Normal" Microsoft Excel document. Formatting applied in Microsoft Excel may be lost if you close the file without saving it in the "Normal" file format.

The following sections provide additional information about transferring files between specific applications.

Microsoft Word, Microsoft Write, or MacWrite

To use a Microsoft Excel worksheet in Microsoft Word, Microsoft Write, or MacWrite, save it in Text format:

- With the worksheet window active, choose File Save As, click Text in the Options dialog box, and save the worksheet.

Microsoft Excel saves your worksheet as a text document; rows are separated by carriage returns, and columns are separated by tabs. Worksheets saved as text documents have no formatting. For example, if your worksheet has a column of dollar amounts surrounded by a border, only tab-separated values would appear in the text document — no dollar signs and no borders.

After you save the Microsoft Excel worksheet as text, you can open it in Microsoft Word, Microsoft Write, or MacWrite and use the information from your worksheet as tabular text.

You can copy a picture of a worksheet selection or a chart to the Clipboard using the Edit Copy Picture command, and then paste it into a Microsoft Word, Microsoft Write, or MacWrite document as a graphic. Worksheet properties such as number formats, borders, and row or column headings are preserved when you copy pictures. You can also use the Clipboard to transfer the data in Rich Text Format (RTF), instead of saving the file as text, to retain formatting.

Tip If you are using Microsoft Word version 4.0 or later and MultiFinder, you can link cells pasted into Microsoft Word to the original Microsoft Excel worksheet. Use the Paste Link command in Microsoft Word to paste and link the copied cells. You can then edit the linked cells in Microsoft Excel and use Microsoft Word commands to automatically update the Microsoft Word copies of the cells to match the Microsoft Excel worksheet cells. For more information on linking Microsoft Word and Microsoft Excel, see *Reference to Microsoft Word*.

To move a Microsoft Word, Microsoft Write, or MacWrite document into Microsoft Excel:

1. Make sure values in the document are separated by tabs and that each line ends with a carriage return.

   In Microsoft Word version 4.0 or later, the values can be formatted as a Microsoft Word table (with cells) instead of as a tab-separated table.
2. In the word processing application, choose the File Save As command.
3. Select the Text Only option for the file format and click the Save button.

   All formatting in the document is lost; however, tab characters and carriage returns are retained.
4. Quit the word processing program and start Microsoft Excel, or use MultiFinder to switch to Microsoft Excel.
5. Use Microsoft Excel's File Open command to open the text file.

   Make sure to select the Tab option as the column delimiter (click the Text button in the File Open dialog box to display the column delimiter options).

Microsoft Excel enters each tab-separated value in a cell within a row. Carriage returns denote new rows.

Microsoft File

If you are using a Microsoft Excel worksheet as a database, you may want to move the records to a new Microsoft File datafile or add them to an existing Microsoft File datafile.

Important Before transferring Microsoft Excel database records to Microsoft File, make a note of the order of the data fields so you can set up your Microsoft File datafile form.

To move Microsoft Excel records to File:

1. From Microsoft Excel, choose File Save As and save the Microsoft Excel worksheet as Text.
2. Quit Microsoft Excel and start File, or use MultiFinder to switch to File.
3. Create a new datafile or open an existing datafile.
4. Set up the datafile form to match the order of the fields in your Microsoft Excel database.
5. Choose Open Datafile from the File menu.
6. Select the Microsoft Excel text document in the list box and click the Open button.

File adds each tab-separated value as a field within a record and each line as a record. File discards any extra values.

Note If you use the Clipboard to copy only a few Microsoft Excel records, you also need to prepare the fields in the File document first.

You might want to move a Microsoft Excel chart to Microsoft File to use as a Picture field or label. Before you can move a chart into a field in a File datafile, the field must be formatted as a Picture field.

To move a Microsoft Excel chart to a File Picture field:

1. With the Microsoft Excel chart window activated, choose Chart Select Chart.
2. Hold down Shift and choose Edit Copy Picture.

3. Select As Shown On Screen under Appearance and Size.
4. Click the OK button.
5. Quit Microsoft Excel and start File, or use MultiFinder to switch to File.
6. Open the datafile and select the Picture field in the datafile window in the record you want to move it to.
7. Choose Edit Paste.

You can also use charts as labels in File non-List Helper forms. After you copy the Microsoft Excel chart to the Clipboard and start File, click to position the insertion point in the Form window of the datafile you want to use. Then, choose Edit Paste.

You may also want to move records from File to a Microsoft Excel worksheet:

1. Save the File datafile as Text (Microsoft Print Merge).
   The first line of this text document contains File field names separated by tabs.
2. Start Microsoft Excel and open the text document.
   You can use the Microsoft File field names for your Microsoft Excel database field names.

Microsoft PowerPoint

You can copy Microsoft Excel worksheet data or charts to Microsoft PowerPoint slides or notes using the Clipboard or Scrapbook. You can also transfer text from PowerPoint slides or notes to a Microsoft Excel worksheet.

To select text in PowerPoint, use the I-beam pointer. When you paste PowerPoint text into Microsoft Excel, each new line of text is pasted into a new row.

Related Information

Reference

For information on	See
Linking to other documents	Linking documents
Copying data	Copying data and formats
Using Microsoft Excel version 1.5 files	Microsoft Excel version 1.5
Opening or saving files in other formats	File Open command File Save As command
Editing Lotus 1-2-3 files in Microsoft Excel	Lotus 1-2-3
Microsoft Mail	Microsoft Mail File Open Mail command File Send Mail command

External reference

An **external reference** is a reference to a specific cell or group of cells on a particular worksheet. An external reference consists of the name of the worksheet, an exclamation point, and the reference or name for a cell or range of cells. For example, SALES!$C$7 refers to the cell in column C, row 7 on a worksheet named SALES. You enter an external reference by typing it or by clicking the cell. An external reference links the document containing it to a supporting worksheet. To calculate the external reference, Microsoft Excel refers to the supporting worksheet for a value.

For more information on external references, see **Absolute reference** and **Linking documents.**

Features and specifications

The following tables list the features and specifications of Microsoft Excel for the Macintosh version 2.2. You will find a features and specifications section for each of the following areas:

- Worksheet
- Chart

- Application development
- Data exchange
- General

Worksheet

Features

- Presentation:

  Multiple fonts per worksheet
  Variable row heights
  Cell borders
  Cell shading
  Text justification
  Optional worksheet gridlines
  User-defined number and text formats
  Control of cell display color
  Independent formats for positive values, negative values, zeros, and text
  Last 3-, 6-, or 9-digit elimination for financial reporting
  Sheet-wide or per-cell zero suppression
  Frozen titles option in display and in printing
  Automatic or manual page break control
  Printing of a worksheet followed by its notes
  Printing of multiple ranges in a single print operation
  Print preview

- Modeling:

  Worksheet linking
  Formula Apply Names command for structuring models
  Naming of ranges and calculated expressions
  Absolute and relative range names
  Range arithmetic (intersection, union)
  Array formulas
  Matrix and multiple regression functions
  One-way (horizontal and vertical) and two-way tables
  Automatic update of tables

- Auditing:

  Cell notes
  Info window for display and printing of cell attributes
  Selection of cell precedents and dependents
  Selection of formula and data cells
  Selection of error cells, number cells, text cells, and logical cells
  Selection of inconsistent formulas in a row or column
  Circular reference indicator pointing to specific cell
  Show values/show formulas display options
  A1/R1C1 reference style options
  Cell locking and formula hiding

- Editing:

  Formula Find and Formula Replace commands
  Insertion and deletion of individual cells or cell ranges
  Copying of cell ranges applying an operation
  Copying of cell ranges skipping blank cells
  Transposing of ranges
  Filling of ranges with a series of numbers or dates
  One-step selection of current cell region
  One-step selection of current array
  One-step selection of current row, current column, or whole worksheet
  Simultaneous selection of multiple cell ranges
  Assisted typing of functions and their arguments
  Assisted typing of names

- Database:

  Forms interface
  Computed and protected fields in forms
  Simple or computed criteria in worksheet
  Extracts from databases on other worksheets
  Linking to databases on other worksheets

- Calculation/memory:

  High-performance, intelligent calculation
  Sparse matrix memory management
  Calculation of all worksheets or active worksheet only
  Manual, Automatic, and Automatic Except Tables calculation
  Iteration

Specifications

Maximum worksheet size	16,384 rows by 256 columns
Column width	0–255 characters
Row height	0–409 points
Maximum length of cell contents (text)	255 characters
Formats:	
Built-in number formats	12
Built-in time/date formats	9
Custom formats	43
Total formats	64
Maximum number of colors per worksheet (actual number depends on number of colors supported by display or printer)	8
Maximum number of fonts per worksheet	Unlimited
Number precision	15 digits
Functions	
Built-in worksheet functions:	
Database	11
Date and time	12
Financial	13
Information	20
Logical	6
Lookup	8
Mathematical	15
Matrix	4
Statistical	14
Text	21
Trigonometric	7
Total worksheet functions	131
Built-in macro functions:	
Command equivalent	115
Action equivalent	46
Customizing	29
Control	10
Value-returning	24
Total macro functions	224

Maximum number of arguments per function	14
Maximum number of custom functions	Limited only by available memory
Maximum number of names per worksheet	Limited only by available memory
Maximum number of tables per worksheet	Limited only by available memory
Maximum number of iterations	32,767
Maximum number of different linked worksheets	Limited only by available memory
Maximum number of windows per worksheet	Limited only by available memory
Maximum number of panes per window	4
Maximum number of selected ranges	2,048
Database:	
Maximum number of records	16,383
Maximum number of fields	256
Maximum length of field	255 characters
Number of sorting keys	3 for a single sort; unlimited when using sequential sorts

Chart

Features

One-step creation of charts based on worksheet selection
One-step chart formatting with Gallery commands
Jump buttons for easy movement between Format commands
Arrows, legends, title, floating and attached text labels
Linking of legend, title, and text labels to worksheet cells
Bypassing of missing data points
Optional marker pattern inversion for negative values
Linear, logarithmic, and semi-logarithmic axis scales
Major and minor axis gridlines
Control of spacing between category tickmarks
Control of chart width/height ratio
Gallery Set Preferred command to set a default chart format
Main/overlay combination charts

Specifications

Built-in chart types available:

Area	5
Bar	7
Column	8
Line	8
Pie	6
Scatter	5
Combination	5
Total	44
Maximum number of charts linked to a worksheet	Limited only by available memory
Maximum number of worksheets referred to by a chart	255
Maximum number of series in one chart	256
Maximum number of data points per series	2,000
Maximum number of total data points	8,100
Maximum number of different fonts in one chart	All installed fonts
Available line styles	5
Available line weights*	3
Available area patterns (screen display)	16
Available foreground colors (color screen display)	8
Available background colors (color screen display)	8
Total area pattern/color combinations (color screen display)	624

*Dotted and dashed lines are available in a single weight.

Maximum number of area patterns** (printer)	16
Maximum number of foreground colors** (color printer)	16
Maximum number of background colors** (color printer)	16
Maximum number of pattern/color combinations** (color printer)	2,656

**Actual number will depend on your printer and its driver software. To take advantage of more than eight colors when printing a chart, set the color of the chart's objects to Automatic.

Application Development

Features

Procedural macro language
Dedicated macro sheets
Sharing of macros among documents
Macro recorder
Assignment and looping macro statements
Macro control of all Microsoft Excel functionality
Macro data exchange with other applications
Macro calling of subroutine libraries
Macro keyboard reassignment
Macro access to ASCII files
Triggering of macros when opening and closing files (autoexec)
Triggering of macros at specified times
Triggering of macros on activation of a window
User-defined menus
User-defined dialog boxes
Dialog editor for easy dialog box creation
User-defined database forms
User-defined Help
Protection of document contents
Protection of window layout
Hiding of windows, status bar, scroll bars, and formula bar

Specifications

Macro sheet functions:

Macro	224
Worksheet	131
Total functions available	355

Maximum number of ASCII files simultaneously accessed by macro	Limited only by operating system
Maximum number of user-defined menu bars active at any time	15

Data Exchange

Features

Direct file opening and saving in all supported formats
Parsing of text files by fixed-width columns
Copying of data to/from other applications through Clipboard
QuickSwitch with Microsoft Word

Specifications

Supported file formats (open/save):

Microsoft Excel file format
Text (tab delimited)
Comma separated values
Symbolic link format
Lotus 1-2-3 version 1A format
Lotus 1-2-3 version 2.0 format
Data interchange format
dBase II format
dBase III format

Supported Clipboard formats (to/from Microsoft Excel):

Format	Clipboard type identifier
Microsoft Excel file format	CF_BIFF
Text (tab delimited)	CF_TEXT
Formatted text	CF_RTF*
Comma separated values	CF_CSV
Symbolic link format	CF_SYLK
Lotus 1-2-3 version 2.0 format	CF_WK1
Data interchange format	CF_DIF
Picture	CF_METAFILEPICT*
Bitmap	CF_BITMAP*

*From Microsoft Excel only

General

Features

- Program:

  Multi-tasking with other applications

- Interface:

  Comprehensive keyboard interface (mouse use optional)
  Undo command
  Repeat command
  Short and full menus
  Progress indication in time-intensive operations

- Document management:

  Workspace files
  Automatic tiling of document windows
  Hiding and unhiding of windows
  One-step access to any visible window

- File management:

  Network support
  File protection and encryption
  Automatic file backup

- Printing:

  Print preview
  Sideways printing (available on printers supporting landscape printing)
  Printing with page headers and footers
  Full laser printer support

- Online documentation:

  Context-sensitive Help
  Help for Lotus 1-2-3 users
  HyperCard Tutorial

Specifications

Maximum basic memory addressable	2 megabytes

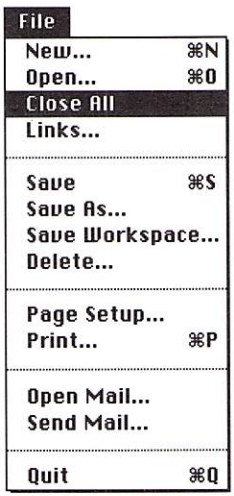
Maximum memory addressable (cell table)	16 megabytes
Maximum expanded memory addressable (heap)	2 megabytes
Number of documents open at any given time	Limited only by available memory
Number of applications running at the same time	Limited only by available memory

Related Information

Reference

For information on	See
Defaults for Microsoft Excel startup file and program options	Default settings
Running Microsoft Excel on a network with your preferred settings	Networks with Microsoft Excel

File Close All command



Closes all of the windows on your screen. File Close All appears only when you hold down Shift when you select the File menu. File Close All appears in place of the File Close command. A dialog box appears for each document with unsaved changes; Microsoft Excel asks if you want to save the changes:

Yes	Saves the changes in that document
No	Ignores the changes in that document
Cancel	Cancels the File Close All command

If you click the Cancel button, no windows are closed, no documents are saved, and you return to the document you were working on when you chose File Close All.

If you want to close just the windows for a single document, use the File Close command.

If you have more than one window open for a single document, and you want to close one of those windows, click the close box in the title bar of that window.

If you have windows that are protected with a password, Microsoft Excel asks you for the appropriate passwords.

File Close command

Closes the active document. If a document has more than one open window, File Close closes all of the document's windows.

If the document contains unsaved changes, Microsoft Excel asks if you want to save the changes:

Yes	Saves the changes in that document
No	Ignores the changes in that document
Cancel	Cancels the File Close command

If you click the Cancel button, no windows are closed, no documents are saved, and you return to the document you were working on before you chose File Close.

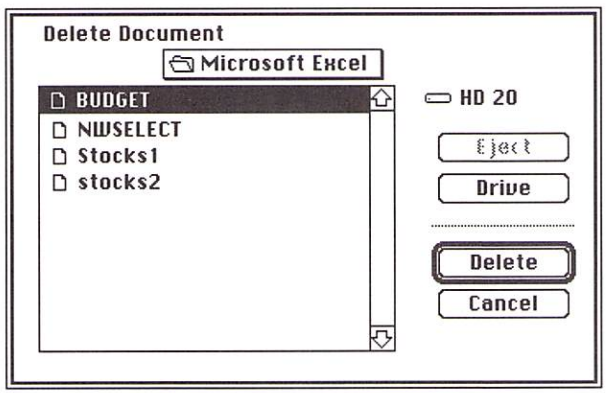
If you have more than one window open for a single document, and you want to close one of those windows, click the close box in the title bar of that window.

If you want to close all windows for all documents, use the File Close All command. To use File Close All, hold down the Shift key when you open the File menu.

File Delete command

(Full Menus)

Deletes files from the current disk.



The folder box shows the name of the current folder. The folder shown in this box determines which files are shown in the list box. For information on working with folders, see **Folders.**

The list box contains the names of all documents, folders, and applications in the current folder on the current drive, except system documents. Select the document or application you want to delete.

Delete Click the Delete button to delete the document or application selected in the list box. Microsoft Excel will not delete an entire folder; if you click Delete while a folder is selected in the list box, Microsoft Excel opens that folder.

Cancel Closes the dialog box. Clicking Cancel does not cancel any deletions.

Eject Click the Eject button to eject the current disk from the disk drive, then insert the disk containing the document you want to delete. This button is grayed if the current disk cannot be ejected.

Drive Click the Drive button to change the current drive and list the documents on other disks.

To delete a file, select the document you want to delete and click the Delete button.

Important File Delete cannot be reversed with the Edit Undo command. If you delete a document, it is not retrievable. However, deleting a document removes it from the disk, not from memory. If you inadvertently delete a document from a disk, you can save the document with the File Save As command while the document is still open.

Because you cannot undo File Delete, Microsoft Excel asks you to confirm that it is deleting the correct file.

Yes	Deletes the file from your disk and returns to the dialog box so you can delete other files
No	Returns to the Delete dialog box so you can select a different file to delete

After you delete a document, the File Delete dialog box stays open so you can delete other documents. When you are finished deleting documents, click the Cancel button.

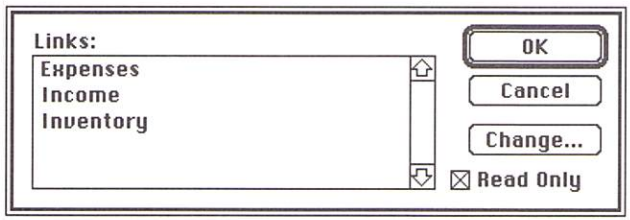
Note Clicking the Cancel button does not reverse any deletions made up to that point. The Cancel button just closes the dialog box and ends the command.

File Links command

(Full Menus)

Opens supporting documents that are linked to the active document. You can also change links.

For more information, see **Linking documents.**



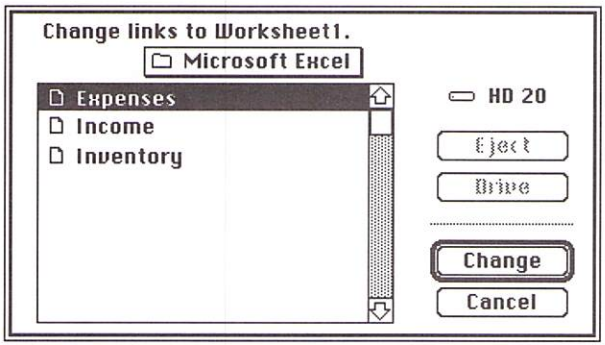
Links Lists the names of the supporting documents for the active worksheet. If a supporting document is closed or in another folder, Microsoft Excel shows the entire pathname in the list box. To open linked documents, select as many as you want to open, then click the Open button. Click to select one document, hold down the Shift key and click to select several documents that are together, or hold down the Command key and click several documents that are not together.

If you usually open the same linked documents each time you use a particular worksheet, you may find it more efficient to create a workspace file. For more information, see **File Save Workspace command.**

Read Only If you open a document with the Read Only check box turned off, others on the network cannot open the document.

If you open a document with the Read Only check box turned on, others can open the same document at the same time. However, you cannot edit a document opened with the Read Only check box turned on.

Change Changes the supporting documents used by external references in the active document. To change a link, select the supporting document in the Links list box and click the Change button. You can select more than one supporting document. For each link you want to change, Microsoft Excel displays a dialog box.



To replace the current supporting document in the link, select a new supporting document and click the OK button. If the document you want to use is in a different folder or on a different drive, first change the drive or folder.

Files Lists the files in the current folder.

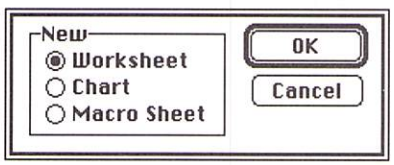
Eject Click Eject to eject the current disk so you can insert the disk containing the linked documents. Eject is grayed if the current disk cannot be ejected.

Drive Click Drive to change the current drive and list files on other drives.

File New command

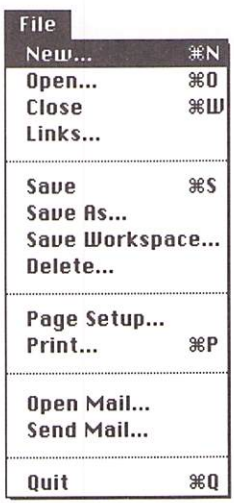
Creates an empty document in a new window.

To create an additional window or windows for a document that is already open, use the Window New Window command. To open an existing document, use the File Open command.



Worksheet Creates a new worksheet. The new worksheet uses the settings in the Options Workspace dialog box (full menus).

Chart Creates a new chart. If you create a new chart while there is a selection on a worksheet, the contents of the selected cells are automatically plotted on the chart using the preferred chart format.

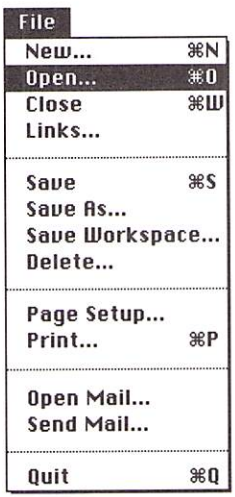


If you create a new chart immediately after cutting or copying data, Microsoft Excel creates a blank chart. Use the Edit Paste or Edit Paste Special command to plot the data in the chart.

For more information on charts, see **Chart.**

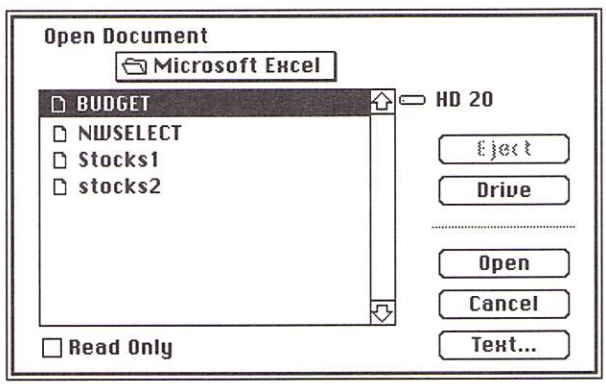
Macro Sheet Creates a new macro sheet. You also create a new macro sheet when you choose the Macro Record command. The new macro sheet uses the settings in the Options Workspace dialog box (full menus).

File Open command



Opens an existing document from the disk and displays it on your screen. If you open a workspace file, the workspace file opens several documents from the disk and displays all of them.

Microsoft Excel can open a document that is in Normal, Text (ASCII), CSV, SYLK, WKS, WK1, DIF, DBF 2, DBF 3, or Microsoft Excel version 1.0 or 1.5 format. Microsoft Excel automatically recognizes the format and opens the document.



Folder Displays the name of the current folder, which controls which documents are shown in the list box. For information on changing folders, see **Folders.** The name of the current disk is displayed above the command buttons.

Files Lists files in the current folder. Select the files you want to open.

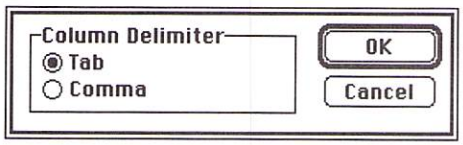
Eject Click Eject to eject the current disk so you can insert the disk with the document you want to open. Eject is grayed if the current disk cannot be ejected.

Drive Click Drive to change the current drive and list the documents on other drives.

Read Only If you open a document with the Read Only check box turned off, others on the network cannot open the document.

If you open a document with the Read Only check box turned on, others can open the same document at the same time. However, you cannot edit a document opened with the Read Only check box turned on.

Text Lets you choose between comma and tab delimiters when opening a text file. This button is grayed unless the selected file is a text file. If you click the Text button, the following dialog box appears:

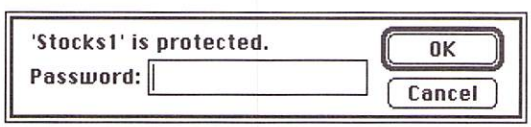


Column Delimiter Click the option for the kind of delimiter you want Microsoft Excel to use to break the text into columns.

Tab	Each tab will cause the following text to go into a new column.
Comma	Each comma will cause the following text to go into a new column.

Opening a Protected Document

If the document was saved with a password, Microsoft Excel will not open the document until you provide the password. This password protection is different from protecting a document from changes with the Options Protect Document command. For information on using a password to protect a document from being opened, see **File Save As command** and **Protecting or hiding data.** For information on using a password to protect a document from being changed, see **Options Protect Document command.**



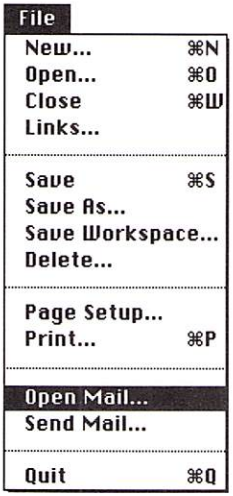
Password Type the password you used when you saved the document.

For more information, see **Opening a document.**

File Open Mail command

Starts Microsoft Mail and lists messages sent to you with the File Send Mail command in Microsoft Excel.

When you read a Microsoft Mail message, the message appears in the standard Microsoft Mail message screen. If you click the Open button, the attached Microsoft Excel document is automatically opened. Any message accompanying the Microsoft Excel document appears in a separate window. All other Mail functions work as they normally do. For more information on Microsoft Mail, see *Microsoft Mail User's Guide.*



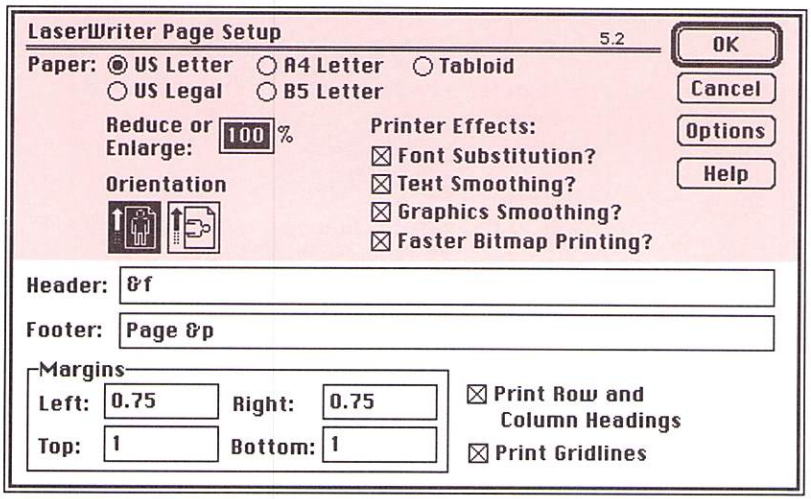
Note To use Microsoft Mail with Microsoft Excel, you must have Microsoft Mail version 2.0 or later.

File Page Setup command

Controls the appearance of the printed document. When you save a document, Microsoft Excel saves the Header, Footer, and Margin settings with your document.

The dialog box Microsoft Excel displays is determined by the type of printer you are using. You change printers with the Apple Chooser command. The dialog boxes shown here are for an Apple LaserWriter. The grayed area of the dialog box will change, depending on your printer. The remainder of this dialog box contains options provided by Microsoft Excel. These options are available on all printers.

Worksheet



Page Header If you want page headers, click in this box and type the text you want Microsoft Excel to use as the header. Microsoft Excel prints the page header at the top of each page, 0.5 inch from the top edge of the paper.

Page Footer If you want page footers, click in this box and type the text you want Microsoft Excel to use as the footer. Microsoft Excel prints the footer at the bottom of each page, 0.5 inch from the bottom edge of the paper.

Note You can tell Microsoft Excel to justify parts of the header or footer to the left, right, or center; to include the page number, date, time, or document name; or to print in a different font, font size, or font style.

Type this	To
&L	Align the characters that follow at the left margin
&C	Center the characters that follow
&R	Align the characters that follow at the right margin
&P	Print the page number
&D	Print the current date
&T	Print the current time
&F	Print the name of the document
&B	Print the left, center, or right part of the header or footer in bold
&I	Print the left, center, or right part of the header or footer in italics
&S	Print the left, center, or right part of the header or footer in strikeout style
&U	Print the left, center, or right part of the header or footer in underline style
&O	Print the left, center, or right part of the header or footer in outline style
&H	Print the left, center, or right part of the header or footer in shadow style
&&	Print a single ampersand

Type this	To
&*"font name"*	Print the left, center, or right part of the header or footer in the font you type in for *"font name."* Make sure to enclose the font name in double quotation marks.
&*"num"*	Makes the header or footer font the size you type in for *"num"*

You can include any or all of these instructions in a single header or footer. For example, you would type *&LBudget&C&P&R&D* to print "Budget" at the left margin, center the page number, and print the current date at the right margin.

Margins The margin settings determine the amount of space between the edge of the paper and the printed worksheet.

The margins are preset to one inch at the top and bottom, and three-quarters of an inch on the sides. To change a margin, click in the margin box and type a number.

Note Margin settings do not affect the placement of headers and footers. When you set your margins, make sure they are large enough to allow space for your headers and footers.

Print Row & Column Headings Turn on this check box if you want the row and column numbers printed.

Print Gridlines Turn on this check box to print the gridlines.

Info Window

When the Info window is active, File Page Setup determines the appearance of the page when you print the information displayed in the Info window.

The File Page Setup dialog box options that appear when the Info window is active work the same as those in the File Page Setup dialog box for worksheets. For a complete description of each of those options, see the preceding "Worksheet" section in this topic.

Chart

File Page Setup displays a slightly different dialog box for a chart than for a worksheet. All options in the chart version of the dialog box work the same as for worksheets. For a complete description of those options, see "Worksheet," earlier in this topic.

Size The two option buttons at the bottom of the dialog box determine what size the chart is printed.

Screen Size	Prints the chart the same size as on the screen
Fit to Page	Prints the chart as large as possible while retaining the height to width ratio shown on the screen

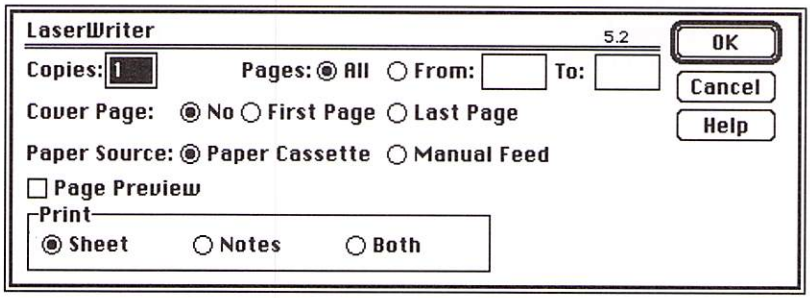
For more information, see **Printing a document**.

File Print command

Prints the active document on the printer you selected with the Apple Chooser. The document is printed according to the settings in the File Page Setup dialog box.

Worksheet

If the active document is a worksheet, and you have defined a print area with the Options Set Print Area command, Microsoft Excel prints only that area. If you do not set a print area, Microsoft Excel prints the entire worksheet. When Microsoft Excel prints a document, it applies all File Page Setup command settings, manual page breaks set with the Options Set Page Break command, and titles defined with the Options Set Print Titles command.



Copies Determines how many copies of the document will be printed.

Pages

All	Prints all the pages in the print area.
From	Prints a range of pages from the print area. Type the number of the first page of the range you want to print.
To	Type the number of the last page of the range.

Cover Page

No	Does not print a cover page.
First Page	Prints a cover page before the worksheet.
Last Page	Prints a cover sheet after the worksheet.

Paper Source Click the paper source you are using for your printer.

Page Preview Allows you to preview the pages and page breaks on the screen before printing. If Page Preview is turned on when you click the OK button, the first page of the document as it will be printed appears in the preview window. In the preview window, you can use the following command buttons:

Next	Shows you the next page of the printed document.
Previous	Shows you the previous page of the printed document.
Zoom	Expands the page to show it full size. You can then scroll to see different parts of the page. Click the Zoom button again to return the page to the reduced preview size.
Print	Prints the document with the options you set in the File Print dialog box.
Cancel	Cancels the File Print command and returns you to the active document.

Print

Sheet	Prints the entire worksheet, or just the part of the worksheet defined by the Options Set Print Area command, but not the notes.
Notes	Prints only the notes from the worksheet. If the Print Row and Column Headings check box is turned on in the File Page Setup dialog box, the cell reference of each note is printed before the note.
Both	Prints the entire worksheet, or just the part of the worksheet defined by the Options Set Print Area command, followed by all the notes. If the Print Row and Column Headings check box is turned on in the File Page Setup dialog box, the cell reference of each note is printed before the note.

Notes are printed by rows. For example, all notes attached to cells in row 1 are printed before the notes attached to cells in row 2.

Info Window

When the Info window is active, File Print prints the information displayed in the Info window for the selected cells on the worksheet. To print all the information about the worksheet, select the entire worksheet before you activate the Info window for printing.

You can change what is displayed in the Info window with the Info menu commands, which are available when the Info window is active.

All File Print dialog box options available for the Info window work the same way as those available for a worksheet. For more information, see "Worksheet," earlier in this topic.

Chart

When a chart is the active document, File Print prints the chart. The size of the chart is determined by the File Page Setup dialog box settings.

The File Print dialog box for charts has fewer options than the dialog box for worksheets, but all the options in the dialog box for charts work the same way as the options for worksheets. For more information, see "Worksheet," earlier in this topic.

File Quit command

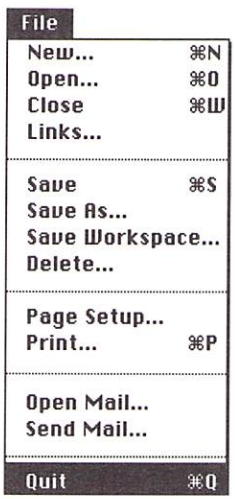
Ends a Microsoft Excel session. If you have made changes to the open documents, Microsoft Excel asks if you want to save the changes:

Yes	Saves the changes to that document
No	Ignores the changes to that document
Cancel	Cancels the File Quit command

If you click the Cancel button, no documents are saved and you return to the document you were working on when you chose File Quit.

For more information on saving documents, see **Saving and closing a document**.

The Clipboard is saved when you exit. If a copied selection is outlined by a marquee on the worksheet when you quit, Microsoft Excel copies the selection to the Clipboard.



File Record Macro command

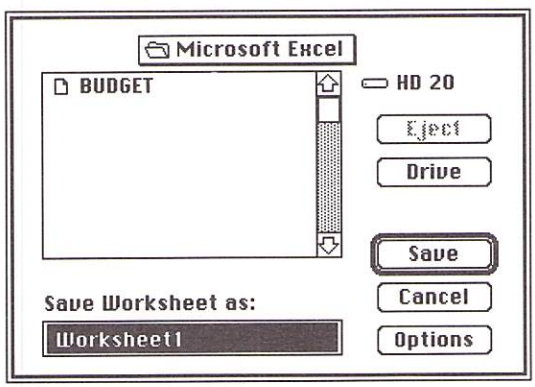
Records subsequent actions as a macro, so you can later repeat those actions by running the macro. This command normally appears on the Macro menu as Macro Record, but is available on the File menu when all documents are either closed or hidden.

For more information, see **Macro Record command.** For information on macros, see *Microsoft Excel Functions and Macros.*

File Save As command

Saves new documents or new versions of existing ones. Use File Save As to save a document that you have not previously saved, to save a document under a different name or file format, or to save a document in another directory.

To save only changes to an existing document, use the File Save command.



Save Worksheet As If the document already has a name, it appears in the text box. To accept the proposed name, click the OK button. To save the document with another name, edit the proposed name or type a new one.

If the name you type has already been used for another document on the disk, Microsoft Excel asks you if you want to replace the existing document.

OK	Replaces the document on your disk with the active document
No	Returns you to the File Save As dialog box without saving the document

Microsoft Excel saves the document in the current folder, shown above the list box. If you want to save the document in a different folder, first change folders. For more information, see **Folders.**

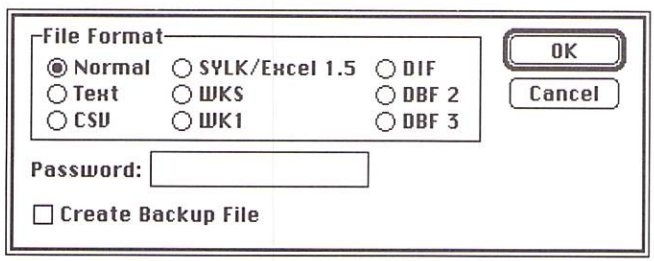
Eject Ejects the current disk. This button is grayed if the current disk cannot be ejected.

Drive Changes the current drive. Click Drive if you want to save the document on a different disk.

Save Saves the document on the current disk using the name in the Save Document As text box.

Cancel Closes the dialog box without saving the document.

Options Displays the options described below.



File Format The formats available in the File Save As dialog box depend on what kind of document you are saving. For example, a chart can be saved only in Normal format, while a worksheet can be saved in any one of the following nine formats.

Normal	The Microsoft Excel version 2.2 standard format. Save a document in Normal format if you are going to use the document with Microsoft Excel or if you plan to link worksheets.
Text	For transferring data to or from a word processor. Saves only the text and values as they are displayed in the cells on the worksheet. Columns are separated by tabs, and rows by carriage returns, but all other format information is lost. If a cell contains a comma or a tab, the value from the cell is enclosed in double quotation marks.

CSV	Comma Separated Values (CSV) format is similar to Text format, except that CSV file format uses a comma to separate fields, instead of a tab. If a cell contains a comma, the value from the cell is enclosed in double quotation marks. You should save CSV files with the extension .CSV. If you open a CSV file that has an extension other than .CSV, Microsoft Excel interprets it as a normal text file.
SYLK/Excel 1.5	Use SYLK for transferring data to another Microsoft spreadsheet program, such as Microsoft Multiplan or previous versions of Microsoft Excel for the Apple Macintosh.
WKS	For transferring data to Lotus 1-2-3, Version 1A, or Symphony on the IBM PC.
WK1	For transferring data to Lotus 1-2-3, Version 2, on the IBM PC.
DIF	For transferring data to an application that requires Data Interchange Format (DIF), such as VisiCalc. DIF format saves values, but not the formulas that produce them.
DBF 2	For transferring the database range to dBASE II.
DBF 3	For transferring the database range to dBASE III.

Password Prevents others from opening the document. If you save the document with a password, Microsoft Excel does not allow the document to be opened without the password. A password can be up to 16 characters long.

Using a password to protect a document from being opened is different from using a password to protect a document from changes. For information on using a password to protect a document from being changed, see **Options Protect Document command** and **Protecting or hiding data.**

Create Backup File Creates a backup copy of the document every time you save the document in the future. To create the backup file, Microsoft Excel renames the old version of the document by preceding the name with "Backup of," then saves the current version of the document under its previous name.

This way you can have the last two versions of a document on your disk: the version you just saved and the previous version.

Important Microsoft Excel always uses the "Backup of" text when making backups. For example, if you have a chart named SALES and a worksheet named SALES, there can only be one "Backup of SALES," and it will only contain a backup of the document you saved last.

After you save a document with File Save As, it remains on the screen, but its name changes to the name you gave it. You can continue to change it and save it under the same name with the File Save command, or under another name with File Save As if you want to keep different versions.

For more information, see **Saving and closing a document.**

File Save command

Saves changes made to the active document. The active document is saved on the disk under the same name you used the last time you saved it and replaces the old copy on the disk. If you want to save the document under a different name or in a different file format, use the File Save As command.

If the document has not previously been saved in Normal or SYLK file format, or if you deleted the document from your disk with the File Delete command, the File Save As dialog box appears when you choose File Save. For more information, see **File Save As command.**

After you save a document, the document remains on the screen and in memory so you can continue working on it.

It is a good idea to save your work often, because a power interruption or failure may cause you to lose changes you've made since the last time you saved.

Important Microsoft Excel saves documents by first removing the old version from your disk, then saving the version currently in memory. If you interrupt File Save by pressing Command+. (period), no copy of the document is left on the disk.

If this happens, you can use the File Save As command to save the document on your disk as long as the document is still open in memory.

If the Create Backup File check box is turned on in the File Save As dialog box, File Save renames the old version of the document by putting the text "Backup of" before the name, then saves the current version of the document under its previous name. For more information on backup files, see **File Save As command.**

For more information, see **Saving and closing a document.**

File Save Workspace command

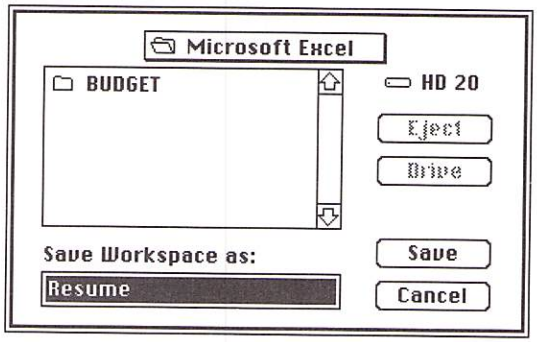
(Full Menus)

Saves a list of the windows and documents open in Microsoft Excel when you choose the command. File Save Workspace also saves all open documents that you have changed since you last saved them.

File Save Workspace is useful whenever you normally use the same set of documents, and you want to open all of them at once.

Important A workspace file contains only a list of the documents that were open when the file was created, not the documents themselves. Do not delete files you need just because they are recorded in a workspace file.

For example, if you have a certain arrangement of worksheets, charts, and macro sheets open for doing your payroll, you can save that arrangement in a workspace file called RESUME PAYROLL. Then, whenever you want to do the payroll, you need only open RESUME PAYROLL, and Microsoft Excel automatically opens all of the necessary worksheets, charts, and macro sheets in the same size and position as they were when you last saved them.



Save Workspace As Type the name for the workspace file you are creating. If you have opened an existing workspace file, Microsoft Excel proposes that workspace name. You can save any changes you've made to the workspace by accepting the proposed name and clicking the OK button. Otherwise, Microsoft Excel proposes the name RESUME. You can create a new workspace file by accepting that name or by typing a new name.

File Send Mail command

(Full Menus)

Sends Microsoft Excel files to other users through Microsoft Mail.

When you choose File Send Mail, Microsoft Excel automatically starts Microsoft Mail, displays the Mail screen, makes the active document an enclosure, makes the name of the document the subject of the message, and puts a message in the message area.

You can edit the message or subject line, decide who should receive the mail, and then click Send to send the file to the specified people. For more information on using Microsoft Mail, see **Microsoft Mail** and *Microsoft Mail User's Guide.*

Note To use Microsoft Mail with Microsoft Excel, you must have Microsoft Mail version 2.0 or later.

Finding cells and data quickly

You don't have to scroll through the rows and columns of your worksheet to find specific cells or data. You can use commands from the Formula menu to go directly to a location in the worksheet.

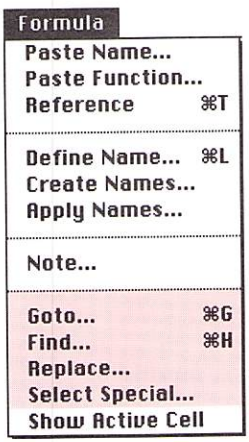
This topic explains:

- Commands for finding cells and data
- Finding specific cells or named ranges
- Finding specific data
- Finding and replacing data
- Finding cells with specific types of contents
- Finding cells that are part of a group
- Finding cells that are different
- Finding cells that refer to each other

For information on finding records in a database, see **Database** and **Data Find command.**

Commands for Finding Cells and Data

You use commands on the Formula menu to find cells and data (full menu shown):



- Use Formula Goto to select the part of the worksheet you specify.
- Use Formula Find to select the first cell that has the contents you specify.
- Use Formula Replace to find the cells that have the contents you specify and to insert new contents.
- Use Formula Select Special to select a cell or cells that contain a specific type of contents, are different, or refer to each other.

Finding Specific Cells or Named Ranges

The Formula Goto command quickly scrolls the worksheet and selects a cell, cell range, or named area. Using the Formula Goto command is just like selecting cells on the worksheet.

After using Formula Goto, you can easily return to the previous cell location. The next time you choose Formula Goto, Microsoft Excel proposes the previous location.

1. Choose Formula Goto.
2. Select a name from the list box or type a cell reference in the Reference text box.
3. Click the OK button.

Note When the formula bar is active, you can choose the Goto command to include a name or cell reference in the formula. When you do so, Microsoft Excel scrolls to that part of the worksheet.

Finding Specific Data

To find cells containing specific formulas, values, or any sequence of characters, use the Formula Find command. For example, you might want to find all cells that are formatted with a percent sign (%), contain the error value #REF!, have formulas that contain the name Sales_1987, or have formulas that contain the reference A1.

If you have a single cell selected, Microsoft Excel starts at that cell and searches the entire worksheet. If you have a range of cells selected, Microsoft Excel looks only within that range.

1. To search the entire worksheet, select a single cell.

   To limit the search, select the cell range you want to search.
2. Choose Formula Find.
3. Type the characters you want to find in the Find What box.
4. To look in the formulas as displayed in the formula bar, click Formula under Look In.

   To look in the values as displayed in the cells, click Values.

   To look in the notes that are attached to cells on the worksheet, click Notes.
5. Under Look At, click Whole to match the entire formula, value, or note; click Part to match part of the formula, value, or note.

6. Under Look By, click Rows to search through rows. Use this option if the cell you are looking for is probably to the left or right of the active cell.

   Click Columns to search through columns. Use this option if the cell you are looking for is probably above or below the active cell.

7. Click the OK button to start the search.

   You can search backward from the active cell by holding down Shift when you click the OK button.

To find the next occurrence of what you last specified, press Command + H. To find the previous occurrence, press Shift + Command + H.

Finding and Replacing Data (Full Menus)

Use the Formula Replace command to find and replace a specific sequence of characters with another sequence of characters in one or more cells on a worksheet.

1. To search the entire worksheet, select a single cell.

   To limit the search, select the cell range you want to search.

2. Choose Formula Replace.
3. In the Replace box, type the characters you want to replace.
4. In the With box, type the characters that will replace what you typed in the Replace box.
5. Under Look At, click Whole to match the entire formula or value; click Part to match part of the formula or value.
6. Under Look By, click Rows to search through rows; click Columns to search through columns.
7. To replace data in the active cell and find the next occurrence, click the Replace button. To search backward, hold down Shift while clicking the Replace button.

   To skip the active cell and find the next occurrence of the data, click the Find Next button. To search backward, hold down Shift while clicking the Find Next button.

   To replace all occurrences of the data in the selection, click the Replace All button.

When there are no more occurrences of the data, Microsoft Excel displays a message.

Finding Cells with Specific Types of Contents
(Full Menus)

You can select all the cells containing specific types of cell contents in a range or in the entire worksheet. Use the Formula Select Special command to make a multiple selection of all cells in a range or in the entire worksheet that contain any of the following:

- **Notes** — selects cells that have notes. Useful for quickly finding information about formulas or models.
- **Constants** — selects cells with constant numbers, text, logical values, error values, or any combination of these. Useful for clearing data while retaining formulas.
- **Formulas** — selects cells with formulas that produce number values, text, logical values, error values, or any combination of these. Useful for finding errors.
- **Blanks** — selects cells that are blank. Useful for finding cells that should contain data, but don't, and are therefore causing formulas to produce misleading results.

1. To search the entire worksheet, select a single cell.
   To limit the search, select the cell range you want to search.
2. Choose Formula Select Special.
3. Click the option for what you want to find.
4. Click the OK button.

Microsoft Excel makes a multiple selection of all cells in the search area that contain the type of contents you selected in the dialog box. You can then move through the cells in the selection with Tab and Shift + Tab, and move among areas of a multiple selection with Command + Tab.

Finding Cells that are Part of a Group
(Full Menus)

You can select the cell range that the active cell is a part of. Use the Formula Select Special command to select the array that the active cell is a part of, if any, or to select a rectangular area containing the active cell and bordered by a blank row or column, or the edge of the worksheet. This is useful for moving or formatting data.

1. Select the cell whose region or array you want.
2. Choose Formula Select Special.

3 Click Current Region or Current Array.

4 Click the OK button.

Finding Cells that are Different (Full Menus)

You can select cells with contents different from those of the active cell or cell range. Use Row Differences and Column Differences in the Formula Select Special dialog box to select all cells in a range or multiple selection that contain formulas different from those in the corresponding cells in the row or column containing the active cell.

Row Differences and Column Differences work the same way, except that Row Differences selects cells in the same row that are different, while Column Differences selects cells in the same column that are different. This section describes how Row Differences works. To use Column Differences, follow the same general rules and procedures.

Note When looking for column differences, Microsoft Excel searches columns, rather than rows as described in the following guidelines.

Microsoft Excel finds row differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells. Microsoft Excel compares the cells in the selection to the cells in the same column as the active cell. The active cell can be within or outside of the selection.
- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each row that are different from the comparison cell in the column containing the active cell, and makes a multiple selection of all the cells that are different.

To select cells that are different in the same row or column:

1 Select the range or ranges you want Microsoft Excel to search for row or column differences.

2 Activate a cell in the row or column you want Microsoft Excel to use as the basis for the comparison.

3 Choose Formula Select Special.

4 Select Row Differences or Column Differences.

5 Click the OK button.

Finding Cells that Refer to Each Other (Full Menus)

Use the Formula Select Special command to find precedents (cells referred to by formulas in the selected cell or cell range), or dependents (cells with formulas that refer to the selected cell or cell range).

Note When searching for precedents and dependents, Microsoft Excel always searches the entire worksheet. If you select a cell range before searching for precedents or dependents, Microsoft Excel selects all cells in the worksheet that are precedents or dependents for any cell in that range.

You can select direct precedents or dependents, or you can select an entire network of precedents or dependents. This is a useful tool for tracing how cells are connected in your worksheet, or for building macros that trace references.

1. Select the cell or cell range whose precedents or dependents you want to select.
2. Choose Formula Select Special.
3. Click Precedents to find the cells referred to by the formulas in the selected cell or cells.

   Click Dependents to find the cells with formulas that refer to the selected cell or cells.
4. Click Direct Only to find only the cells directly referred to by the selected cell or cells, or the dependents that specifically refer to the selection.

   Click All Levels to find all precedents, including the precedents of the precedents, or all dependents, including dependents of the dependents.
5. Click the OK button.

Related Information

Reference

For information on	See
Selecting in worksheets and macro sheets	Keyboard Worksheet
Using the Info window to display precedents and dependents	Info window

Folders

A **folder** is a convenient grouping of documents and programs you store on a hard disk or floppy disk. In Microsoft Excel, as in most other Macintosh applications, you store data files and programs as **documents** in folders. A folder is like a file drawer that stores a particular group of documents. In addition to documents, a folder can contain other folders. For example, you can put the Microsoft Excel application files in one folder and keep a separate folder for document files you create with Microsoft Excel.

This topic explains:

- Essential terms
- How Microsoft Excel uses the active folder
- Techniques for working with folders

This topic does not discuss all procedures and conventions related to working with folders and documents on the Apple Macintosh. For more information, see the Macintosh documentation included with your computer.

Essential Terms

This section lists key terms related to folders and document management with Microsoft Excel:

Document — in Microsoft Excel, each separate file you create (worksheet, chart, or macro sheet), in the form in which it is stored on your disk.

Note This topic focuses on managing documents in folders. There are two other types of Microsoft Excel documents: **workspace files** and **applications.** A workspace file is a list of documents open in the workspace at one time that you can use to reopen those same documents together. Applications include the main program file for Microsoft Excel. For more information on workspace files, see **Workspace file.**

Document name — the name of a particular document or program.

Drive — the disk drive in which a folder is stored.

Active folder — the default folder Microsoft Excel uses at a given time for document access operations such as opening and saving.

Pathname — the complete information needed to specify a particular document, including the name of the document and the folders it is enclosed in. For example, HARD DISK:WORK:REGIONS:WEST is a full pathname that includes:

- Disk drive. In the example, HARD DISK is the disk drive.
- Each folder enclosing the document (each followed by a colon). In the example, WORK and REGIONS are folders.
- The document name. In the example, WEST is the document name.

Note For an illustration of the relationship between the folders and documents plus additional examples of using pathnames, see "Managing Linked Worksheets in Different Folders," in **Linking documents.**

How Microsoft Excel Uses the Active Folder

At any given time, Microsoft Excel is set to use a specific folder on your hard disk or floppy disks for document access operations such as opening or saving documents. This folder is called the active folder.

When you first start Microsoft Excel, the active folder is usually the one in which you installed the Microsoft Excel program. If Microsoft Excel isn't installed in a folder, then the top level folder of the current drive is the default folder. You can store Microsoft Excel documents in this folder, but you may prefer to store them in one or more folders organized by types of documents, frequency of use, current documents and archived documents, or other organizational methods.

You can open or save a document in a folder other than the active folder by moving through the folders and selecting another folder name before typing a name for the document (see the next section in this topic for techniques). Microsoft Excel then designates the folder you just selected as the active folder.

Microsoft Excel defaults to the active folder under the following conditions:

- If you use the File Save As command to save a document without specifying a folder, Microsoft Excel saves it in the active folder.
- If you choose the File Open command or File Delete command, Microsoft Excel displays the names of documents in the active folder in the list box.
- If you choose the File Open command, specify a document name without opening a folder first, and click the OK button, Microsoft Excel looks for the specified document in the active folder.

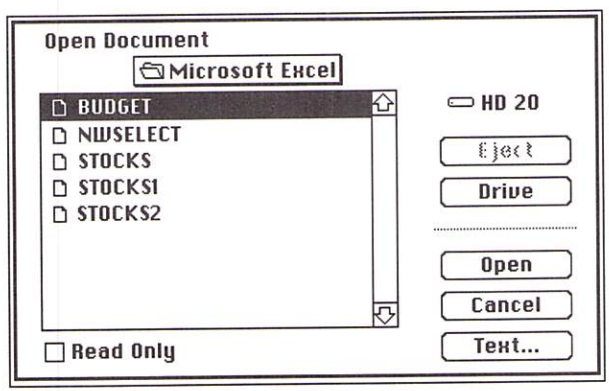
- If you type a document name in an external reference in a formula without including a path, Microsoft Excel searches the active folder for the document referred to in the external reference.

For a summary of techniques for working with folders using the File Open dialog box, see the next section in this topic. For more information on using the File Open command, see **Opening a document.**

For more information on using the File Save As command or the File Delete command, see **Saving and closing a document** or **Deleting a document,** respectively. For more information on external references, see **Linking documents.**

Techniques for Working with Folders

You can use the File Open dialog box to work with folders in several ways. The following illustration shows the parts of the File Open dialog box:



The following table lists techniques for working with folders in the File Open dialog box:

To	Choose File Open and do this
Open a document in the active folder	Select the document in the list box; then click the Open button.
Change the active folder to a different folder and display all documents in that folder in the list box	Select the folder from the list box, or click the name of the active folder displayed above the list box and drag to select a higher-level folder.
Change the current drive to another drive	Click the Drive button.

You can also change the active folder from the File Delete dialog box and from the File Links dialog box when you click the Change button. For more information, see **Deleting a document** and **Linking documents,** respectively.

Related Information

Reference

For information on	See
Starting or quitting Microsoft Excel	Starting Microsoft Excel Quitting Microsoft Excel
Opening or saving documents	Opening a document Saving and closing a document
Guidelines for naming documents	Saving and closing a document

Font

The term **font** refers to the design of the typeface in which characters are displayed or printed. **Font name** is a particular typeface design (for example, Helvetica or Times). **Font size** refers to the height of the characters and is usually measured in points (for example, 9-point type or 12-point type). **Font style** is how the font appears (for example, plain, bold, or italic). Varying the fonts, font sizes, and font styles in a worksheet or chart is one way to make the document more attractive and easier to read.

This topic explains:

- Worksheet fonts

  Available fonts in Microsoft Excel
  Applying a worksheet font
  Changing the standard font

- Chart fonts

Note All worksheet font options also apply to macro sheets.

Worksheet Fonts

Available Fonts in Microsoft Excel

The fonts available with Microsoft Excel vary according to the fonts installed in the Macintosh System that you use to start your Macintosh. Use the Font/DA Mover to add fonts to your Macintosh System. See your *Macintosh* manual for information on how to install fonts. Most fonts are designed to work with certain printers. For the best printing results, use fonts that were intended to be used with the printer on which you will be printing.

The default screen font for a new worksheet is Geneva 10. The "standard" font is initially the same as the default font. Data you enter in a new, unformatted worksheet is automatically displayed in the standard font. You can change the standard font with the Options Standard Font command.

Applying a Worksheet Font

To change the font of selected cells, use the Format Font command.

1. Select the cells you want to format.
2. Choose Format Font.

   A dialog box displays the available fonts, sizes, styles, and colors. If you have a black and white monitor, you can still change the font color. Colors are indicated by the first letter of each color. The correct color will be used when you display the document on a color monitor or print the document on a color printer.
3. Select the font name and font size you want and, optionally, select a font style and color. If the name or size of the font you want is not listed, type the name or size in the appropriate text box.

   To apply the standard font, turn on the Standard Font check box.
4. Click the OK button.

Note If the Format Row Height dialog box is set to Standard Row Height, Microsoft Excel adjusts the height of rows to accommodate the largest font in each row.

For more information, see **Format Font command**.

Changing the Standard Font

The standard font is automatically used for cells to which you have not applied a font. If you haven't applied any fonts to the worksheet, changing the standard font changes the font for the entire worksheet.

1. Choose Options Standard Font.
2. Select the font name and size and, optionally, select a font style and color.
3. Click the OK button.

All the cells formatted with the standard font change to the new standard font.

Note When you change the standard font, Microsoft Excel adjusts the width of all columns proportional to the change in the size of the standard font. The adjustment preserves the number of characters that fit in each column.

Chart Fonts

Any text in a new chart is initially formatted in Geneva 10. You can reformat chart text with any font available in your Macintosh system. Font changes in chart text do not affect the worksheet. For more information, see **Chart text** and **Format Font command.**

You can change the font for one piece of chart text, or for all text in the chart.

To change font, size, color, and style for one piece of chart text

1. Select the text.
2. Choose Format Font.
3. Select the options you want.
4. Click the OK button.

To change font, size, color, and style for all chart text

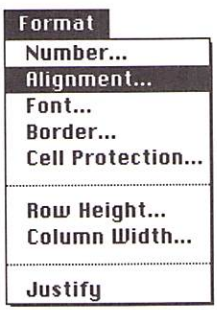
1. Select the chart by choosing the Chart Select Chart command.
2. Choose Format Font.
3. Select the options you want.
4. Click the OK button.

Related Information

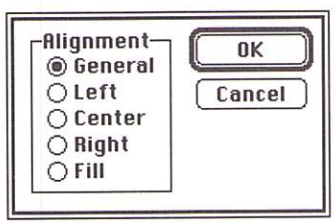
Reference

For information on	See
Formatting worksheets and charts (general overview)	Formatting a document
Aligning text	Alignment
Formatting borders and adding shading	Borders and shading
Using automatic color formats for numbers and text	Number Text

Format Alignment command



Aligns the contents of the selected cells. Initially, all cells in the worksheet use General alignment.



Alignment

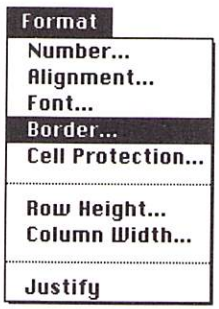
General	Aligns text to the left, aligns numbers to the right, and centers logical and error values
Left	Aligns all cell contents to the left
Center	Centers all cell contents
Right	Aligns all cell contents to the right
Fill	Repeats the contents of the cell until the cell is full. If there are blank cells to the right that also have the Fill format, they are filled as well.

For more information, see **Alignment**.

Format Border command

Adds solid border lines and/or shading to the cells in the selection.

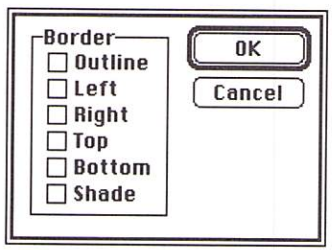
Use Format Border to add emphasis. For example, you can add top borders to cells containing totals to separate them from data above, or you can use shading or boxes to bring attention to important parts of your worksheet.



Adjoining cells share borders. For example, putting a bottom border on one cell produces the same effect as putting a top border on the cell below it.

Select the cells you want to format, then choose Format Border. You can turn on any combination of borders or shading.

Borders are different from gridlines. For information on controlling gridlines, see **Options Display command**. For information on printing gridlines, see **File Page Setup command**.



Outline Puts a border around the outermost edges of the entire selection.

Left Puts a border on the left edge of every cell in the selection.

Right Puts a border on the right edge of every cell in the selection.

Top Puts a border on the top edge of every cell in the selection.

Bottom Puts a border on the bottom edge of every cell in the selection.

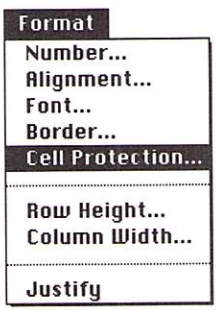
Shade Shades every cell in the selection.

Tip You can create a double underline under a row of cells with the following procedure:

1. Insert a blank row below the row you want to underline.
2. Put top and bottom borders on the blank row.
3. Use the Format Row Height command or drag the row heading to make the blank row as narrow as the distance you want between the double underlines.

Format Cell Protection command

(Full Menus)

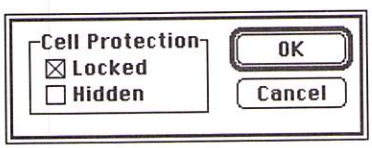


Controls whether the formulas in the selected cells can be edited and whether they are displayed in a protected worksheet.

Generally, you lock cells to protect them from being changed accidentally; you hide and lock cells for security, so that others can neither see nor change your formulas.

Note Format Cell Protection affects individual cells only when the worksheet is protected with the Options Protect Document command. If the worksheet is not protected, the Format Cell Protection settings are ignored.

For more information, see **Options Protect Document command** and **Protecting or hiding data**.



Locked On a new worksheet, all cells are locked. If you protect a worksheet with the Options Protect Document command, you cannot edit locked cells. You can unlock individual cells or cell ranges by selecting them and turning off the Locked check box while the worksheet is unprotected.

Hidden On a new worksheet, no cells are hidden. If you turn on the Hidden check box for a range of cells, and then protect the worksheet with the Options Protect Document command, the formulas in that range of cells do not appear in the formula bar.

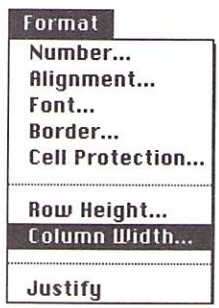
Format Column Width command

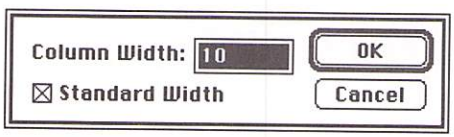
Sets the width of the selected columns.

You need not select the entire column. If any cell in a column is selected, the new column width applies to all cells in that column. Format Column Width changes the width of all columns in the selection, including hidden columns.

To change the width of a column with the mouse, point to the line to the right of the column heading for the column you want to change, and drag.

For more information, see **Column**.



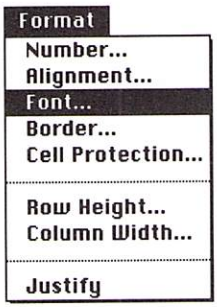


Column Width Accept the proposed response or type a different width. You can define column widths in decimal fractions. A column can be up to 255 characters wide, or it can be hidden by setting its width to 0 (zero).

Standard Width Standard column width is 10 characters. The width you see on the screen varies depending on the width of the standard font. For information on the standard font, see **Font.**

Format Font command

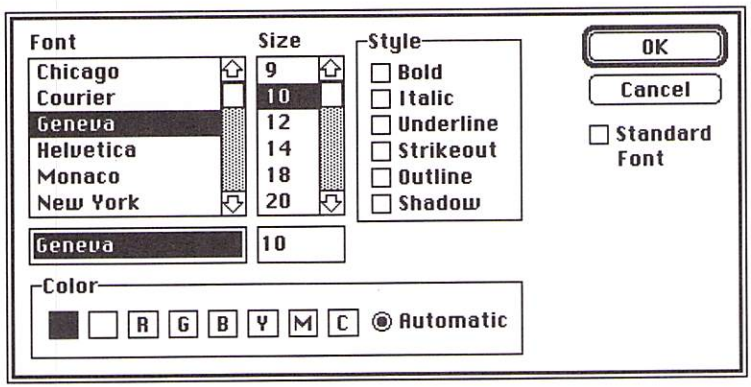
Changes the font of the selected cell or cell range.



Worksheet

You can change the font for a single cell or for a range of cells. All cells in your worksheet use the standard font until you apply a different font. You can have as many different fonts on your worksheet as you want.

Note Format Font changes the font of the selected cells. To change the standard font that is initially used for all cells in the worksheet, use the Options Standard Font command.



Font The fonts installed in the System file on your startup disk are listed in the list box. Scroll to see the available fonts and select one, or type the name of an available font.

If you want to use fonts other than those on your disk, use the Font/DA Mover to add or delete fonts. See your *Macintosh* manual for details.

Size Select or type a font size. If you type a size different from the ones offered for a particular font, Microsoft Excel produces the size as closely as possible, but the results may look ragged.

Microsoft Excel automatically adjusts the height of all rows set to Standard Row Height to accommodate the new font size. If you have set a specific row height in the Format Row Height dialog box, the row stays that height until you change it or set it to Standard Row Height. Fonts larger than the row height will appear clipped. For more information on changing the row height, see **Format Row Height command**.

Style Turn on any combination of the available font styles.

Bold	Makes the selected text bold
Italic	Makes the selected text italic
Underline	Underlines the selected text
Strikeout	Puts a horizontal line through the selected text
Outline	Makes the selected text outlined rather than solid
Shadow	Adds a shadow to the selected text

Color Click a color. If you do not have a color monitor, you can still set a color. The setting is stored, and the color is displayed correctly when the worksheet is opened on a computer with a color monitor. If you use the Format Number command to apply number formats that use color, these colors take precedence over the color you set here. For more information on number formats, see **Format Number command.**

If you click Automatic, Microsoft Excel automatically uses the system font color.

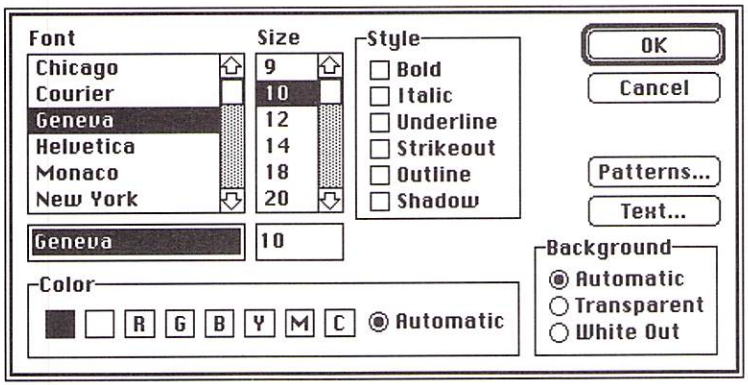
Standard Font Applies the standard font to the selected cells. The standard font is defined with the Options Standard Font command, and is initially used by all cells until changed.

For more information, see **Font.**

Chart

If you choose Format Font when a chart is the active document, Microsoft Excel displays a dialog box that allows you to change the font of the selected text. If you select the entire chart with the Chart Select Chart command before choosing Format Font, all text in the chart uses the new font.

If there is no text on the chart, or if there is no text selected, Format Font is grayed on the menu. For information on adding text to your chart, see **Chart Attach Text command** and **Chart text**.



The Font, Size, and Style options work the same way they do for worksheets. For more information, see the descriptions in the "Worksheet" section earlier.

Background Controls the appearance of the area behind the text.

Automatic	Microsoft Excel selects the background pattern for you
Transparent	Leaves the background area transparent, so you can see what is behind the text
White Out	Whites out a rectangular area large enough to accommodate the text

Note White Out does not always use white. If you have a background pattern defined for the text, or if you use a background color other than white, Microsoft Excel uses that pattern or color instead of white.

Color Controls the color of the text.

Note If you print a chart with text set to Automatic color, the text is always printed black. The background for text with Automatic color is always printed white.

Patterns Carries out any changes you have made in the Format Font dialog box and displays the Format Patterns dialog box.

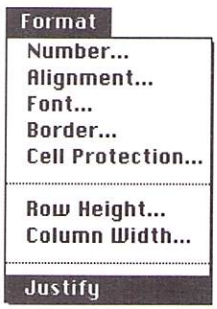
Scale Carries out any changes you have made in the Format Font dialog box and displays the Format Scale dialog box.

Text Carries out any changes you have made in the Format Font dialog box and displays the Format Text dialog box.

Format Justify command

(Full Menus)

Rearranges the text in the left column of a range so that all cells in the range display text of approximately the same width.



All the cells in the left column of the range should contain text or be blank. Although the other cells in the range can contain text, values, or formulas, they should be blank or they will interfere with the display of the text.

Format Justify evenly distributes all the text in the left column of the selection by merging the text into a single string of text, then putting enough text in the upper-left cell to fill to the edge of that row of the selection, then putting enough text in the next cell down to fill to the edge of that row of the selection, and so on.

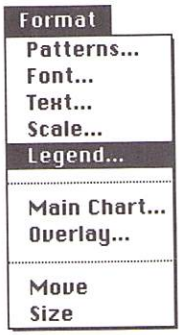
If the range you have selected is not large enough to accommodate the text, Microsoft Excel asks you if it can go beyond the current length of the selection. If you click the OK button, and there is data in cells that will be overlapped by the justification, the contents of those cells is replaced by the justified text.

If you replace data that you wanted to keep, you can choose the Edit Undo command to reverse Format Justify and return the text to the way it was before you justified it.

Blank Cells

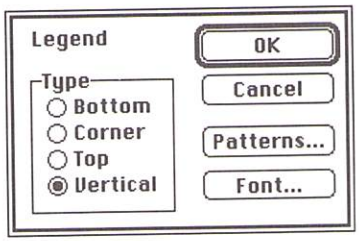
Blank cells in the left column act as paragraph separators. A blank cell or cells divide the range into separate sections that are each justified individually. For example, if the selected cell range is five rows high, and the third cell in the left column is blank, then the top two rows of the selection are justified together and the bottom two rows of the selection are justified together.

Format Legend command



Determines the position and orientation of the legend on a chart.

For information on adding a legend to your chart, see **Chart Add Legend command** and **Chart**.



Type

Bottom	Moves legend to bottom of chart and orients legend horizontally
Corner	Moves legend to upper-right corner of chart and orients legend vertically
Top	Moves legend to top of chart and orients legend horizontally
Vertical	Moves legend to right side of chart and orients legend vertically

Patterns Carries out any changes you made in the Format Legend dialog box and displays the Format Patterns dialog box.

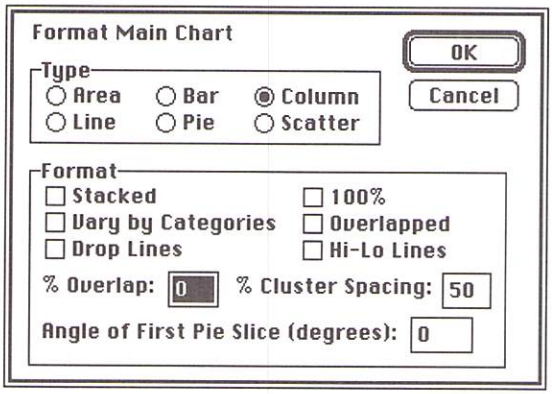
Font Carries out any changes you made in the Format Legend dialog box and displays the Format Font dialog box.

Format Main Chart command

Controls the type and formats of the main chart.

Although the dialog box contains all of the format options the various chart types use, only those relevant to the selected chart type are available. Options that are not relevant to the selected chart type are grayed.

For information on formatting charts, see **Chart**.



Type The chart type options are similar to the commands in the Gallery menu.

Area	Makes the main chart an area chart
Bar	Makes the main chart a bar chart
Column	Makes the main chart a column chart
Line	Makes the main chart a line chart
Pie	Makes the main chart a pie chart
Scatter	Makes the main chart a scatter chart

Stacked Stacks data point markers above each other rather than placing them next to each other. Within a category, the value from the first series is measured from the series axis. The value from the second series is measured from the top of the value from the first series, and so on. (See format 3 in the column gallery.)

Vary by Categories Applies only when the chart includes a single series. If this check box is turned on, Microsoft Excel assigns a different color or pattern to each data point. (See format 2 in the column gallery.)

Drop Lines Drop lines extend from the highest value in each category to the category axis. (See format 3 in the area gallery.)

100% The values in each category are shown as percentages adding up to 100 percent. The absolute values do not appear on the chart. The series themselves are not altered. (See format 5 in the column gallery.)

Overlapped When this check box is turned on, the number you type in the % Overlap box determines how much the markers within a cluster overlap, rather than how far apart they are. (See format 4 in the column gallery.)

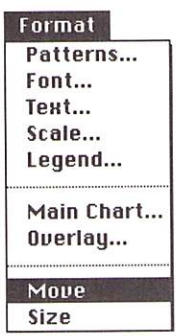
Hi-Lo Lines Hi-lo lines extend from the highest to the lowest value in each category. (See format 7 in the line gallery.)

% Overlap If the Overlapped check box is turned on, this option determines how much the markers in a cluster overlap. If the Overlapped check box is turned off, this option determines how much space there is between bars or columns within a cluster. The number you type here represents a percentage of the width of a bar or column.

% Cluster Spacing Determines how much space there is between clusters of bars or columns. The number you type here represents a percentage of the width of a bar or column.

Angle of First Pie Slice In a pie chart, this represents the angle of the first edge of the first slice. The angle is measured in degrees clockwise from vertical.

Format Move command



Lets you move a chart object with the keyboard.

To move a chart object, select the object, choose Format Move, move the object with the Direction keys, and then press Enter.

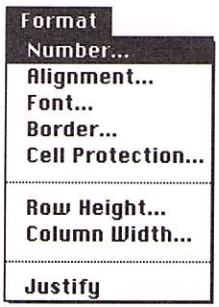
You can also move a chart object by dragging it. When dragging to move an object, avoid dragging the black selection squares.

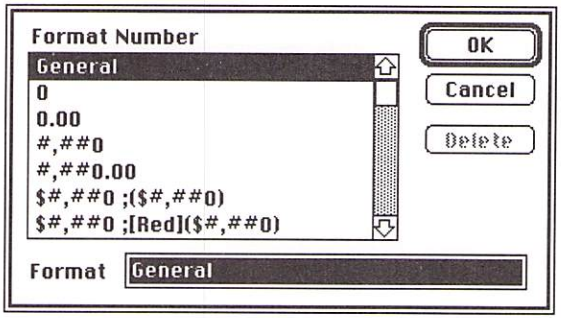
For information on selecting chart objects, see **Chart**.

Format Number command

Determines how Microsoft Excel displays numbers, dates, and times. You can use one of the 21 built-in formats, or you can create your own custom formats.

When you choose Format Number, Microsoft Excel displays a dialog box with number formatting choices in a list box. Scroll the list box to see all the available formats.





Format Number Lists all available number formats. Except for General format, the choices in the list box are combinations of symbols that represent what each format looks like. Each number format except General is called a **picture**.

Unless you specify a different format, Microsoft Excel uses General format. General format displays numbers in the selection as precisely as possible. If the number is longer than will fit in the cell, Microsoft Excel displays it in scientific notation.

Format Shows the picture currently selected in the Format Number list box. When you want to create custom formats, you use this text box either to edit an existing format or type an entirely new one. If you edit an existing format, Microsoft Excel keeps the original format when it saves the new one.

Delete Deletes the selected custom format. You can only delete formats you have created; you cannot delete the Microsoft Excel built-in formats.

Number Formats

A number format is composed of up to four sections separated by semicolons: three number sections and a text section. The text section can be omitted, and the number sections can be collapsed into only one or two sections.

If there are three sections, the first section is the format used for a positive number, the second section is the format used for a negative number, and the third section is the format used for zeros. If there are two sections, the first one is used for positive numbers and zeros, and the second one for negative numbers. If there is only one section, that format applies to all numbers.

A text section, if included, is always the last in the list. Unless it is preceded by three number sections, a text section must include the text placeholder (@). For information on the text section and on creating your own number formats, see **Number**.

If you have semicolons with nothing between them, the missing section prevents that type of number from being displayed. For example, you could create a picture format like the following:

format if positive;;;format if text

Because this number format does not define how to display negative numbers (the second section) or zeros (the third section), any cells with this format appear blank if they contain a negative number or zero.

The following table lists the built-in number formats and shows examples of each format for a positive number, a negative number, and a fraction.

	Number typed		
Format	**5**	**−5**	**.5**
General	5	−5	0.5
0	5	−5	1
0.00	5.00	−5.00	0.50
#,##0	5	−5	1
#,##0.00	5.00	−5.00	0.50
$#,##0 ;($#,##0)	$5	($5)	$1
$#,##0 ;[RED]($#,##0)	$5	($5)*	$1
$#,##0.00 ;($#,##0.00)	$5.00	($5.00)	$0.50

*Displayed in red.

Format	Number typed		
	5	−5	.5
$#,##0.00 ;[RED]($#,##0.00)	$5.00	($5.00)*	$0.50
0%	500%	−500%	50%
0.00%	500.00%	−500.00%	50.00%
0.00E+00	5.00E+00	−5.00E+00	5.00E−01

*Displayed in red.

Note Note that the dollar formats produce trailing spaces for positive numbers.

Date and Time Formats

The list box also includes date and time formats. The following table lists the built-in date and time formats and shows examples of each.

Format	Display
m/d/yy	12/7/58
d-mmm-yy	7-Dec-58
d-mmm	7-Dec
mmm-yy	Dec-58
h:mm AM/PM	8:50 PM
h:mm:ss AM/PM	8:50:35 PM
h:mm	20:50
h:mm:ss	20:50:35
m/d/yy h:mm	12/7/58 20:50

Automatic Formats

Microsoft Excel applies some of the date and time formats automatically, depending on how you enter the date or time. For information on date formats, see **Date**. For information on time formats, see **Time**.

Format Symbols

The following list shows all the symbols used in the Microsoft Excel number formats. You use these same formats when you create your own custom number formats. For information on custom number formats, see **Number**.

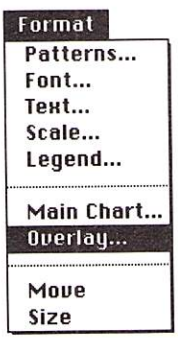
This symbol	Means this
General	Display the number in General format.
0	Digit placeholder. If the number has fewer digits on either side of the decimal point than there are zeros on either side of the decimal point in the format, Microsoft Excel displays the extra zeros. If the number has more digits to the right of the decimal point than there are zeros to the right in the format, Microsoft Excel rounds the number to as many decimal places as there are zeros to the right. If the number has more digits to the left of the decimal point than there are zeros to the left in the format, Microsoft Excel displays the extra digits.
#	Digit placeholder. Follows the same rules as for 0 above, except that Microsoft Excel does not display extra zeros if the number has fewer digits on either side of the decimal point than there are number signs on either side in the format.
.	Decimal point. This symbol determines how many digits (zeros or number signs) Microsoft Excel displays to the right and left of the decimal point. If the format contains only number signs to the left of this symbol, Microsoft Excel begins numbers smaller than 1 with a decimal point. To avoid this, you should use zero as the first digit placeholder to the left of a decimal point instead of number sign.
%	Percentage. Microsoft Excel multiplies by 100 and inserts the % character.
,	Thousands separator. Microsoft Excel separates thousands by commas if the format contains a comma surrounded by number signs or zeros.
E− E+ e− e+	Scientific format. If a format contains one zero or number sign to the right of an E−, E+, e−, or e+, Microsoft Excel displays the number in scientific format and inserts an E or e. The number of zeros or number signs to the right determines the number of digits in the exponent. Use E− or e− to place a minus sign by negative exponents. Use E+ or e+ to place a minus sign by negative exponents and a plus sign by positive exponents.

This symbol	Means this
: $ − + ( ) space	Display that character. To display a character other than one of these, precede the character with a backslash (\) or enclose the character in double quotation marks ("").
\	Display the next character in the format. Microsoft Excel does not display the backslash. This is the same as enclosing the next character in double quotation marks.
*	Repeat the next character in the format enough times to fill the column width. You cannot have more than one asterisk in one section of a format.
"Text"	Display whatever text is inside the double quotation marks.
@	Text placeholder. If there is text in the cell, the text from the cell is placed in the format where the @ character appears.
m mm mmm mmmm	Display the month as a number without leading zeros (1–12), as a number with leading zeros (01–12), as an abbreviation (Jan–Dec), or as a full name (January–December). If you use m or mm immediately after the h or hh symbol, Microsoft Excel displays the minute rather than the month.
d dd ddd dddd	Display the day as a number without leading zeros (1–31), as a number with leading zeros (01–31), as an abbreviation (Sun–Sat), or as a full name (Sunday–Saturday).
yy yyyy	Display the year as a two-digit number (00–99), or as a four-digit number (1900–2078).
h hh	Display the hour as a number without leading zeros (0–23), or as a number with leading zeros (00–23). If the format contains an AM or PM, the hour is based on the 12-hour clock. Otherwise, the hour is based on the 24-hour clock.
m mm	Display the minute as a number without leading zeros (0–59), or as a number with leading zeros (00–59). The m or mm must appear after an h or hh, or Microsoft Excel displays the month rather than the minute.

This symbol	Means this
s ss	Display the second as a number without leading zeros (0-59), or as a number with leading zeros (00-59).
AM/PM am/pm A/P a/p	Display the hour using a 12-hour clock. Microsoft Excel displays AM, am, A, or a for times up until noon, and PM, pm, P, or p for times between noon and midnight.
[Black]	Changes the color of the characters displayed in the cell to black.
[Blue]	Changes the color of the characters displayed in the cell to blue.
[Cyan]	Changes the color of the characters displayed in the cell to cyan.
[Green]	Changes the color of the characters displayed in the cell to green.
[Magenta]	Changes the color of the characters displayed in the cell to magenta.
[Red]	Changes the color of the characters displayed in the cell to red.
[White]	Changes the color of the characters displayed in the cell to white.
[Yellow]	Changes the color of the characters displayed in the cell to yellow.

Format Overlay command

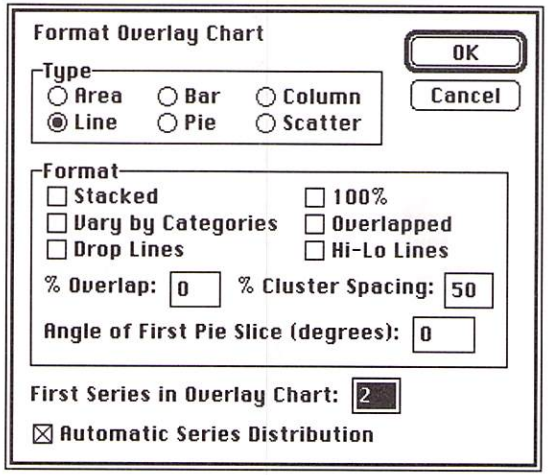
(Full Menus)



Controls the overlay chart's type and formats.

Although the dialog box contains all the format options the various chart types use, only those relevant to the selected chart type are available. Options that are not relevant to the selected chart type are grayed.

For more information on formatting charts, see **Chart**.



Type The chart type options are similar to the commands in the Gallery menu.

Area	Makes the overlay chart an area chart
Bar	Makes the overlay chart a bar chart
Column	Makes the overlay chart a column chart
Line	Makes the overlay chart a line chart
Pie	Makes the overlay chart a pie chart
Scatter	Makes the overlay chart a scatter chart

Stacked Within a category, the value from the first series is measured from the series axis. The value from the second series is measured from the top of the value from the first series, and so on. (See format 3 in the column gallery.)

Vary by Categories Applies only when the chart includes a single series. If this check box is turned on, Microsoft Excel assigns a different color or pattern to each data point. (See format 2 in the column gallery.)

Drop Lines Drop lines extend from the highest value in each category to the category axis. (See format 3 in the area gallery.)

100% The values in each category are shown as percentages adding up to 100 percent. The absolute values do not appear on the chart. The series themselves are not altered. (See format 5 in the column gallery.)

Overlapped When this check box is turned on, the number you type in the % Overlap box determines how much the markers within a cluster overlap, rather than how far apart they are. (See format 4 in the column gallery.)

Hi-Lo Lines Hi-lo lines extend from the highest to the lowest value in each category. (See format 7 in the line gallery.)

% Overlap If the Overlapped check box is turned on, this option determines how much the markers in a cluster overlap. If the Overlapped check box is turned off, this option determines how much space there is between bars or columns within a cluster. The number you type here represents a percentage of the width of a bar or column.

% Cluster Spacing Determines how much space there is between clusters of bars or columns. The number you type here represents a percentage of the width of a bar or column.

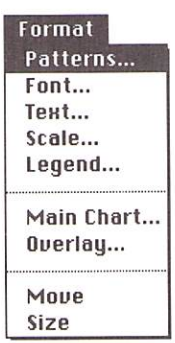
Angle of First Pie Slice In a pie chart, this represents the angle of the first edge of the first slice. The angle is measured in degrees clockwise from vertical.

First Series in Overlay Chart Controls which data series Microsoft Excel puts in the overlay chart. Type the plot order number, as displayed in the series formula, of the first series you want Microsoft Excel to plot in the overlay chart. Microsoft Excel plots that series, and any other series with higher plot order numbers, in the overlay chart.

For example, if you have six series, and you type *4*, the series with plot order numbers 4, 5, and 6 appear on the overlay chart while the series with plot order numbers 1, 2, and 3 remain on the main chart. For more information on plot order, see **Chart.**

Automatic Series Distribution If this check box is turned on, Microsoft Excel automatically divides the data series evenly between the main chart and the overlay chart. If there is an odd number of data series, the main chart has one more than the overlay chart.

Format Patterns command



Changes the appearance of the selected object in a chart.

Before you choose Format Patterns, select the object or objects you want to change. To select the entire chart, use the Chart Select Chart command. To select the entire plot area, use the Chart Select Plot Area command. If you double-click a chart object, Microsoft Excel automatically displays the Format Patterns dialog box.

For more information on selecting in a chart, see **Chart, Chart Select Chart command,** and **Chart Select Plot Area command**.

When you choose Format Patterns, Microsoft Excel displays a dialog box with only those options that apply to what you have selected. Look in the following list for the options you see in the dialog box.

Invisible

◉ Invisible

The selected part does not appear on the chart. For example, you might want the text background pattern to be invisible so that whatever is behind the text will be visible.

Axes, tickmark labels, and gridlines cannot have an invisible pattern. Use the commands from the Chart menu to add or delete these chart objects.

Automatic

○ Automatic

If a data point or series is selected, Automatic picks a color or pattern that distinguishes each data point or series from the others.

If something other than a data point or series is selected, Automatic makes the color or pattern the same as the window background.

Apply to All

☐ Apply
To All

Appears in the dialog box only when a data point, a data series, or text attached to a data point is selected. This option applies the choices you make in the dialog box to all data points in the chart.

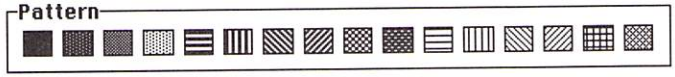
If you have a combination chart, and the selected object is in the overlay chart, the formats are applied only to the data points in the overlay chart. If the selected object is in the main chart, the formats are applied only to data points in the main chart.

Invert If Negative

☐ Invert if Negative

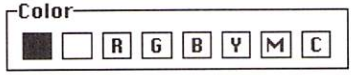
Reverses the pattern for markers representing negative values. For example, if the foreground is set to blue and the background to red, positive markers have a blue foreground and negative markers have a red foreground.

Pattern



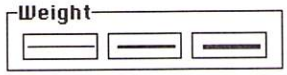
Controls background, border, area, line, axis, and arrow patterns. A pattern other than solid is a combination of the foreground and background colors. If you have a color monitor, you can create an almost unlimited number of patterns by changing the pattern and the foreground and background colors.

Color



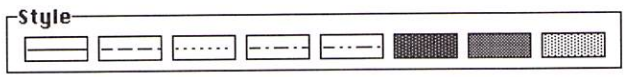
Controls the color of the object, its foreground, its background, or its border. You can select from black, blue, cyan, green, magenta, red, white, or yellow.

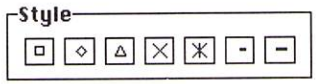
Weight



Changes the weight of a line, border, arrow shaft, or axis. If the weight of a line is medium or heavy, the style of the line automatically changes to solid.

Style



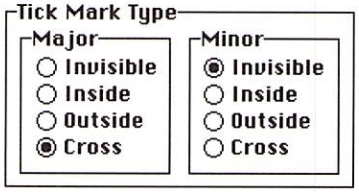


Controls the line style of axes or of an object's border. Also controls the style of markers in a line chart. You can only change the style of a line that has a light weight. If the weight of the line is medium or heavy, the only style you can use is solid.

Shadow

Adds a shadow to the bottom and right sides of the selected chart, text, or legend.

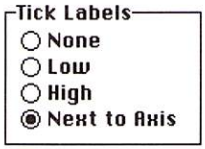
Tick Mark Type



Controls the appearance of tickmarks on your axes.

Invisible	Tickmarks are invisible
Inside	Tickmarks appear only on the side of the axes next to the chart
Outside	Tickmarks appear only on the side of the axes away from the chart
Cross	Tickmarks cross the axes

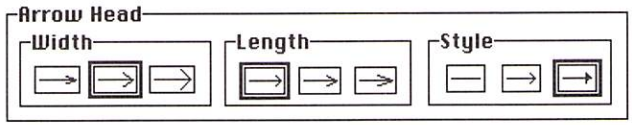
Tick Labels



Controls the position of the labels that appear next to the tickmarks on the axes of your chart.

None	Removes tickmark labels
Low	Labels appear at low end of axis
High	Labels appear at high end of axis
Next to Axis	Labels appear next to axis This is the usual placement for tickmark labels.

Arrowhead



Controls the width, length, and style of the selected arrowhead. Select any combination of width, length, and style options to make the arrowhead appear the way you want.

Font

Font...

Carries out any changes you have made in the Format Patterns dialog box and displays the Format Font dialog box.

Legend

Legend...

Carries out any changes you have made in the Format Patterns dialog box and displays the Format Legend dialog box.

Scale

Scale...

Carries out any changes you have made in the Format Patterns dialog box and displays the Format Scale dialog box.

Text

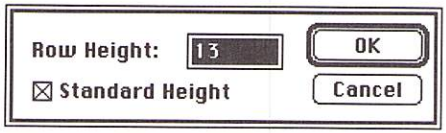
Text...

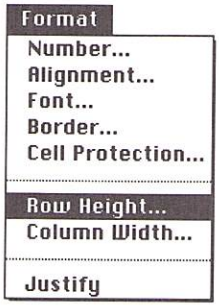
Carries out any changes you have made in the Format Patterns dialog box and displays the Format Text dialog box.

Format Row Height command

Sets the height of the selected rows. Row height is measured in points, as are fonts.

You need not select the entire row. If any cell in a row is selected, the new row height applies to all cells in that row. Format Row Height changes the height of all rows in the selection, including hidden rows.





Row Height Accept the proposed response or type a different height. You can define row height in decimal fractions. You can hide a row by setting its height to zero.

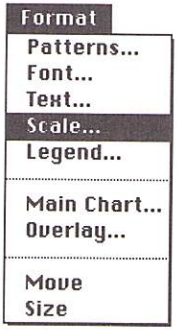
Standard Height Changes the row height to accommodate the largest font in each row of the selection.

To change the height of a row with the mouse, drag the line below the row heading for the row you want to change.

Format Scale command

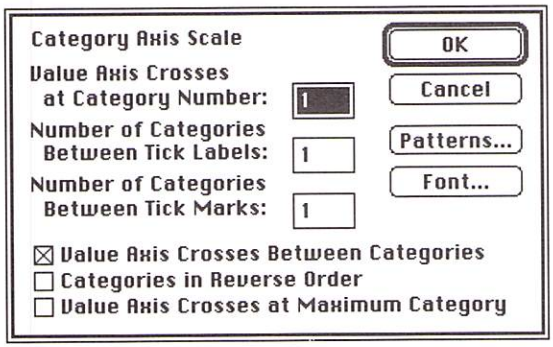
Controls the appearance of the axes, the order in which the categories or values are given, and where the axes cross each other. For the category axis, this command also controls the interval between tickmarks and the interval between tickmark labels. For the value axis, this command also controls the range of values displayed, the scale used, and whether the scale is logarithmic.

Microsoft Excel displays a different dialog box depending on which axis is selected when you choose Format Scale.



Note For all chart types except scatter charts, there is a difference between the Category Axis Scale dialog box and the Value Axis Scale dialog box. When you are formatting the axes of a scatter chart, both dialog boxes look like the Value Axis Scale dialog box.

Category Axis



Value Axis Crosses at Category Number Type the number of the category at which you want the value axis to cross the category axis. Normally this number is 1.

Number of Categories Between Tick Labels Initially, every category has a tickmark label, so this number is 1. Type *2* to label only every other category, type *3* to label every third category, and so on.

Number of Categories Between Tick Marks Controls the number of categories that appear between each pair of tickmarks.

Value Axis Crosses Between Categories When this check box is turned off, the value axis crosses through the center of the category indicated in the Value Axis Crosses at Category Number box. Turn on this check box to make the value axis cross between two categories.

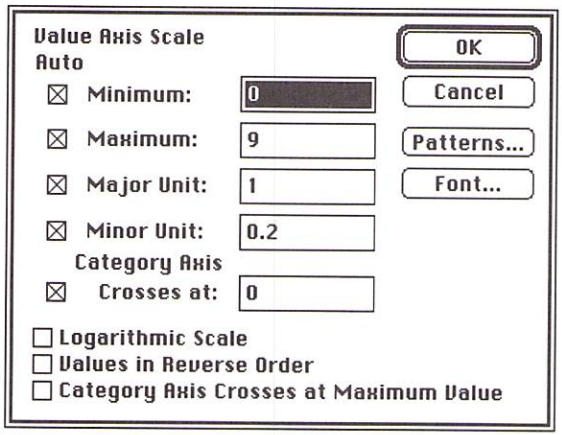
Categories in Reverse Order Microsoft Excel normally presents categories from left to right. Turn on this check box to reverse the order.

Value Axis Crosses at Maximum Category Turn on this check box to make the value axis cross the category axis at the last category.

Patterns Carries out any changes you have made in the Format Scale dialog box and displays the Format Patterns dialog box.

Font Carries out any changes you have made in the Format Scale dialog box and displays the Format Font dialog box.

Value Axis



This dialog box appears when you select the value axis before choosing Format Scale. A nearly identical dialog box appears when you select the category axis of a scatter chart before choosing Format Scale.

The first five options in the dialog box are initially set to Automatic. For each of these options, you can let Microsoft Excel set the option automatically or set it yourself.

Minimum When the Automatic check box is turned on, Microsoft Excel includes the lowest values in all included series in the chart. If you type a number in the text box, values below the number you type are not shown on the chart. The data series themselves are not affected.

Maximum When the Automatic check box is turned on, Microsoft Excel includes the highest values in all included series in the chart. If you type a number in the text box, values above the number you type are not shown on the chart. The data series themselves are not affected.

Major Unit When the Automatic check box is turned on, Microsoft Excel calculates the distance between major tickmarks. If you type a number in the text box, Microsoft Excel uses that number instead.

Minor Unit When the Automatic check box is turned on, Microsoft Excel calculates the distance between minor tickmarks. If you type a number in the text box, Microsoft Excel uses that number instead.

Category Axis Crosses At When the Automatic check box is turned on, the category axis crosses the value axis at zero. If the value axis range doesn't include zero, the category axis crosses at the value closest to zero. Either turn on the Automatic check box or type the value at which you want the category axis to cross the value axis.

Logarithmic Scale When the scale is logarithmic, Microsoft Excel recalculates the following values and units:

Minimum value	The automatic minimum value is the largest power of 10 that is less than the lowest data point. If all values are zero or less, the minimum value is 0.1.
Maximum value	The automatic maximum value is the smallest power of 10 that is greater than the highest value. If all values are zero or less, the maximum value is 1.
Major unit	Must be a power of 10.
Minor unit	The automatic minor unit is the same as for a nonlogarithmic scale. If you change the minor unit, it must be one-half or one-tenth of the major unit.

Values in Reverse Order Microsoft Excel normally presents values in descending order from top to bottom. Turn on this check box to reverse the order.

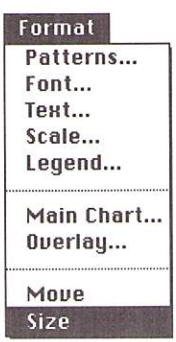
Category Axis Crosses at Maximum Value Turn on this check box to make the category axis cross the value axis at the last value.

Value Axis Crosses at Maximum Category This option only appears when the category axis is selected in a scatter chart when you choose Format Scale. Turn on this check box to make the value axis cross the category axis at the last category.

Patterns Carries out any changes you have made in the Format Scale dialog box and displays the Format Patterns dialog box.

Font Carries out any changes you have made in the Format Scale dialog box and displays the Format Font dialog box.

Format Size command



Enables you to change the size of a chart object with the keyboard.

To resize a chart object, select the object, choose Format Size, resize the object with the Direction keys, and then press Enter.

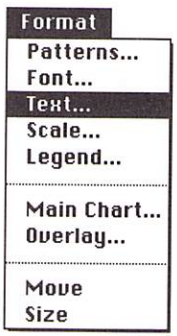
You can also resize a chart object by dragging the black selection squares that appear when the object is selected.

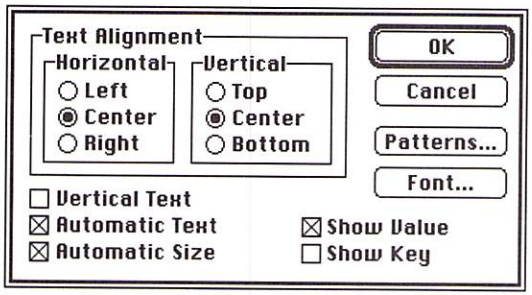
For information on selecting chart objects, see **Chart.**

Format Text command

Controls the alignment of the selected chart text.

When you select text on a chart and choose Format Text, Microsoft Excel displays the dialog box shown below.





Text Alignment Controls horizontal and vertical alignment of the text within the text border.

Vertical Text Stacks text vertically, so that it is read top to bottom rather than from left to right.

Automatic Text If the selected text was created with the Attach Text command and later edited, this option restores the original text.

Automatic Size If you have changed the size of the border around the selected text, this option restores the border to automatic size. Automatic size makes the border fit exactly around the text no matter how you change the text.

Show Value If the selected text is attached to a data point, this option replaces the text with the data point's value.

Show Key If the selected text is attached to a data point or data series, this option shows the pattern used by the data point or series next to the text.

Patterns Carries out any changes you have made in the Format Text dialog box and displays the Format Patterns dialog box.

Font Carries out any changes you have made in the Format Text dialog box and displays the Format Font dialog box.

Formatting a document

Formatting typically involves changing the appearance of a document and its elements or enhancing the document's overall presentation and design.

This topic briefly summarizes each procedure you can use for formatting worksheets, macro sheets, and charts in Microsoft Excel. The cross-reference for each task tells you what topic to look in for more detailed information on a dialog box option or the related step-by-step procedure.

This topic explains:

- Formatting a worksheet

  General worksheet formatting guidelines
  Standard and custom formats for numbers and text
  Font and alignment formats
  Border, row, column, and gridline formats
  Window display formats
  Print formats

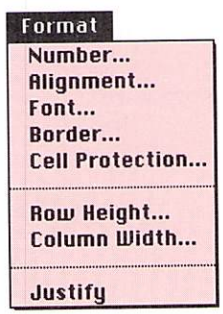
- Formatting a chart

  Adding or formatting chart objects
  Adding or formatting chart text

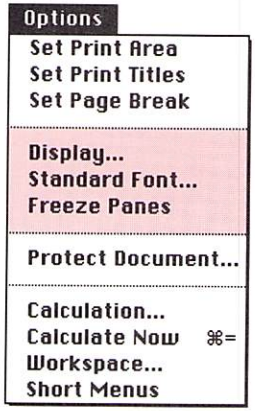
Note All worksheet formats also apply to macro sheets.

Formatting a Worksheet

The main worksheet formatting commands are on two menus (full menus shown):



The Format menu commands control the formats of specific cells and ranges.



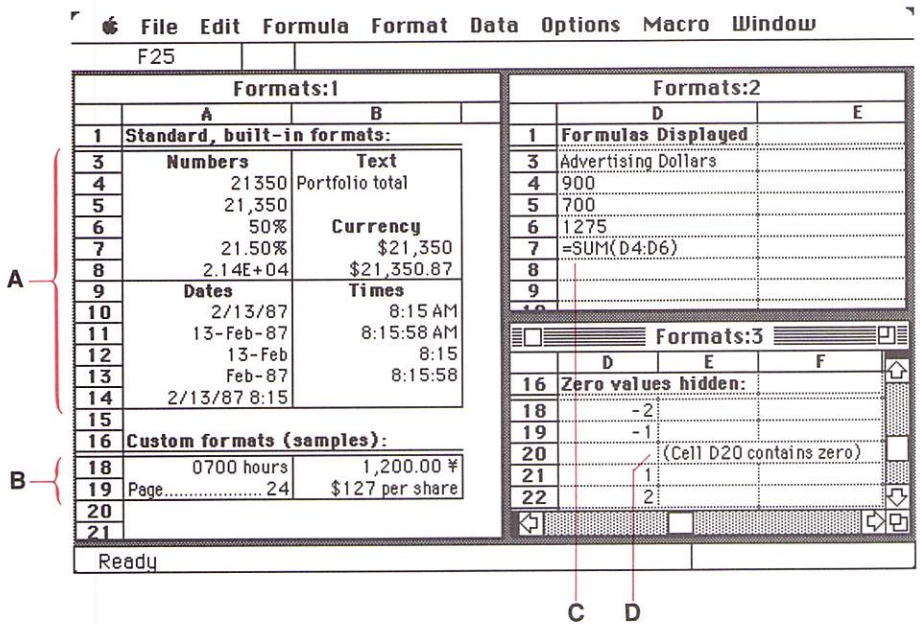
The Options menu commands, shown tinted here, control format settings for the entire worksheet.

For information on each command, see the topic of the same name.

General Worksheet Formatting Guidelines

- **When you change a cell's format, its underlying value does not change.** You can change the appearance of a cell without affecting its formula or value. For example, number formats affect only the way numbers are displayed. In calculating a formula, Microsoft Excel always uses the underlying cell value. (Microsoft Excel calculates on the basis of values displayed only when you turn on Precision as Displayed with the Options Calculation command. For more information, see **Calculation.**)
- **You can assign dollar, percent, date, and time formats to cells as you type.** Just type the value the way you want it to appear and Microsoft Excel automatically assigns the nearest matching built-in format. No additional formatting is necessary, unless you want to change the format.
- **You can format a cell or range before or after you enter the data.** If you're entering a lot of data that uses the same numeric format, you might find it easier to format the selected cells before you start typing. Then the data appears in that format as you enter it. You can also select and format the cells after you enter the data.
- **A cell remains formatted, even after you clear the contents of the cell.** Unless you also clear the format or reformat a cell, new data of the same data type entered in the cell is displayed in the existing format. For example, if you enter a currency figure in a cell that already has a date format, Microsoft Excel displays the figure in the date format. To correctly display the currency figure, reformat the cell with the Format Number command.
- **When you copy a cell with the Edit Copy command or one of the Edit Fill commands, its format is copied along with the cell contents.**

Standard and Custom Formats for Numbers and Text



A To use Microsoft Excel standard formats for numbers, text, currency, dates, or times:

- Select cell/range and choose Format Number; select format from dialog box and click OK.
- For step-by-step procedure, see **Number** (for numbers, text, and currency), **Date,** or **Time.**

B To create a custom format for numbers, text, currency, dates, or times:

- Select cell/range and choose Format Number; in the text box, type your own format or edit an existing format and click OK.
- For step-by-step procedure and a table of codes you can use to create custom formats, see **Number** (for numbers, text, and currency), **Date,** or **Time.**

Tip To use color (black, blue, cyan, green, magenta, red, white, or yellow) in standard or custom formats for numbers and text:

- Select cell/range, choose Format Number, and select a format; in the text box, type the color you want in square brackets in the space before the format characters (for example, *[blue]m/d/yy*), and click OK.
- For more information, see **Number.**

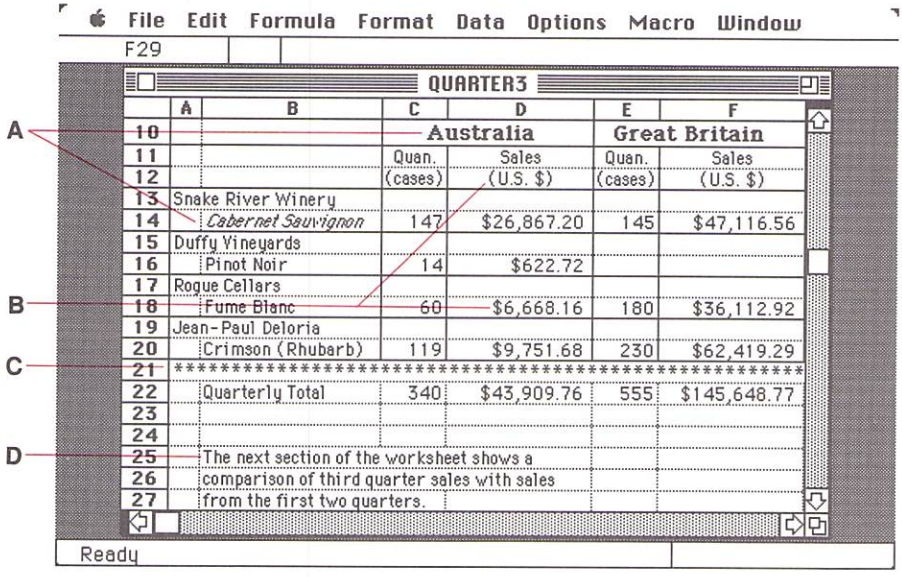
C To display formulas (or values) in a worksheet:

- Choose Options Display; turn on (or turn off) Formulas check box and click OK.
- For step-by-step procedure and information on other display options, see **Display options.**

D To hide (or display) zero values in a worksheet:

- Choose Options Display; turn off (or turn on) Zero Values check box and click OK.
- For step-by-step procedure and information on other display options, see **Display options.**

Font and Alignment Formats



A To change font, style, or color of text in a cell or range:

- Select cell/range and choose Format Font; select font and size from list box; optionally, turn on Style check boxes or click a different color, and click OK.
- For step-by-step procedure, see **Font.**

B To align text and numbers:

- Select cell/range and choose Format Alignment; click option in dialog box and click OK.
- For step-by-step procedure, see **Alignment.**

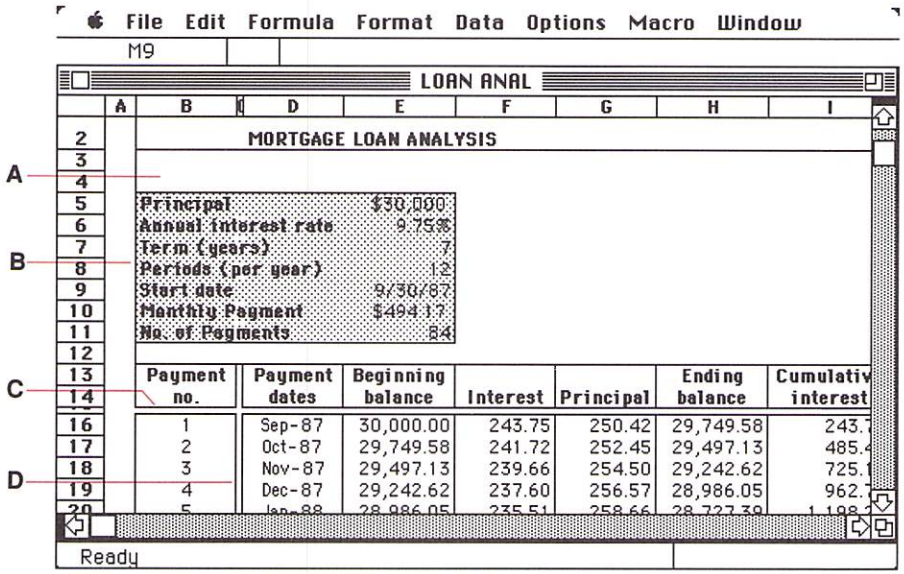
C To fill a cell or row (partial or complete) with a repeated character or characters:

- Enter the character(s) in one cell and select cells you want to fill; choose Format Alignment, click Fill option, and click OK.
- For step-by-step procedure, see **Alignment.**

D To justify a paragraph of text to fit a single- or multiple-column width (full menus):

- Select the cells containing text and include the range in which you want the text to fit; choose Format Justify.
- For step-by-step procedure, see **Alignment.**

Border, Row, Column, and Gridline Formats



A To hide (or display) gridlines on screen display (does not affect printed document):

- Choose Options Display; turn off (or turn on) Gridlines check box and click OK.
- For step-by-step procedure, see **Display options.**

To control screen colors for gridlines and row and column headings:

- Choose Options Display; select options from dialog box and click OK.
- For step-by-step procedure, see **Display options.**

B To add borders or shading to a cell or range:

- Select cell/range and choose Format Border; turn on check boxes for options you want and click OK.
- For step-by-step procedure, see **Borders and shading.**

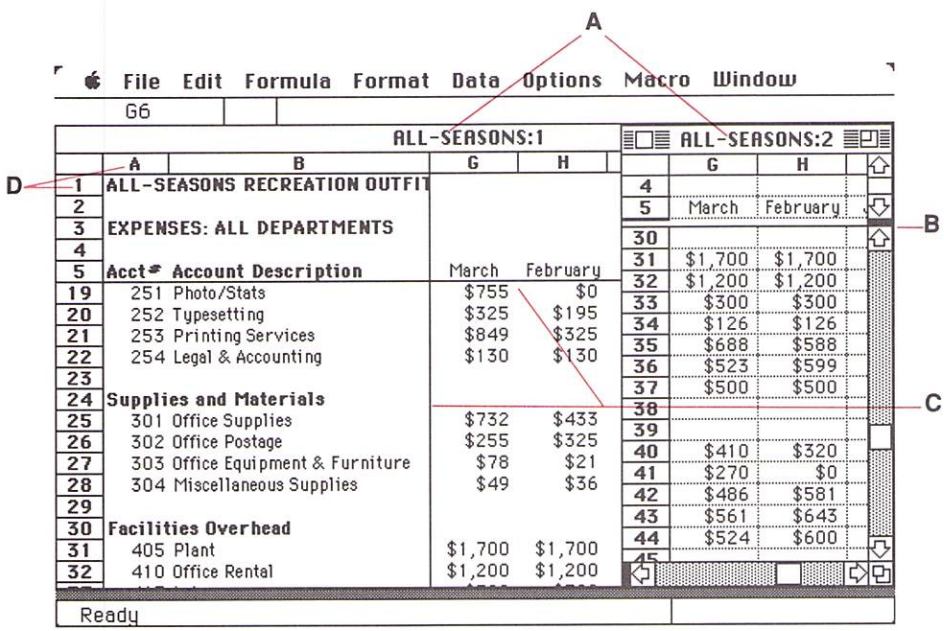
C To adjust row heights:

- Drag the line below the row heading up or down. Or, select cell/range; choose Format Row Height, type row height in text box, and click OK.
- For step-by-step procedure, see **Row.**

D To adjust column widths:

- Drag the line to the right of the column heading left or right. Or, select cell/range; choose Format Column Width, type width in text box, and click OK.
- For step-by-step procedure, see **Column.**

Window Display Formats



A To open multiple windows into a worksheet:

- Choose Window New Window; if you want, size the windows separately and scroll them to different parts of the worksheet.
- For step-by-step procedure, see **Windows.**

B To split a window into panes:

- Drag vertical or horizontal split bar to where you want the split.
- For step-by-step procedure, see **Windows.**

C To freeze column and/or row titles on the display (full menus):

- Split window into panes (see preceding procedure) along right or bottom edge of cells with titles you want to freeze; choose Options Freeze Panes.
- For step-by-step procedure, see **Windows.**

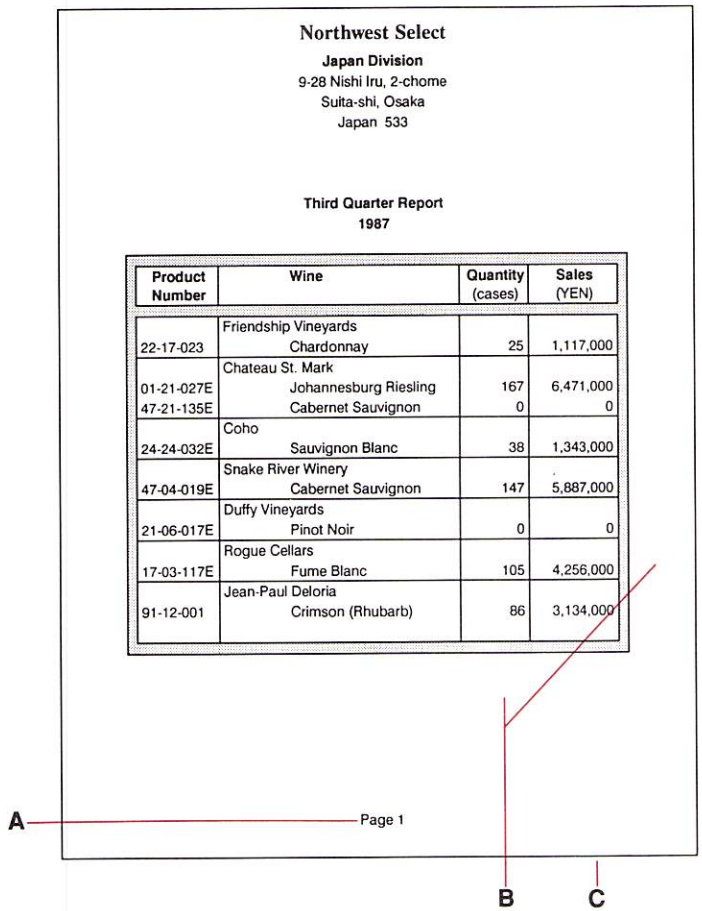
D To use R1C1 (or A1) format for row and column headings (full menus):

- Choose Options Workspace; turn on (or turn off) R1C1 check box and click OK.
- For step-by-step procedure, see **Display options.**

To hide (or display) row and column headings on screen display (does not affect printed document):

- Choose Options Display; turn off (or turn on) Row and Column Headings check box and click OK.
- For step-by-step procedure, see **Display options.**

Print Formats



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Japan Division
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Sulta-shi, Osaka
Japan 533

Third Quarter Report
1987

Product Number	Wine	Quantity (cases)	Sales (YEN)
22-17-023	Friendship Vineyards Chardonnay	25	1,117,000
01-21-027E	Chateau St. Mark Johannesburg Riesling	167	6,471,000
47-21-135E	Cabernet Sauvignon	0	0
24-24-032E	Coho Sauvignon Blanc	38	1,343,000
47-04-019E	Snake River Winery Cabernet Sauvignon	147	5,887,000
21-06-017E	Duffy Vineyards Pinot Noir	0	0
17-03-117E	Rogue Cellars Fume Blanc	105	4,256,000
91-12-001	Jean-Paul Deloria Crimson (Rhubarb)	86	3,134,000

A To format headers and footers in a printed document:

- Choose File Page Setup, type header and/or footer codes in Header and Footer text boxes, and click OK.
- For step-by-step procedure and a table of codes you can use to customize headers and footers, see **Headers and footers.**

B To set margins for a printed document:

- Choose File Page Setup, type measurements you want in the Margins text boxes, and click OK.
- For more information on dialog box options, see **File Page Setup command.**

C To specify horizontal or vertical page orientation:

- Choose File Page Setup; under Orientation, click horizontal or vertical icon, and click OK.
- For step-by-step procedure, see **Printing a document.**

To hide (or display) row and column headings when you print:

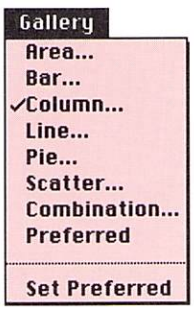
- Choose File Page Setup; turn off (or turn on) Print Row and Column Headings check box and click OK.
- For information on dialog box options, see **File Page Setup command.**

To hide (or display) gridlines when you print:

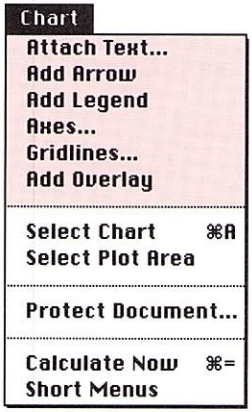
- Choose File Page Setup; turn off (or turn on) Print Gridlines check box and click OK.
- For information on dialog box options, see **File Page Setup command.**

Formatting a Chart

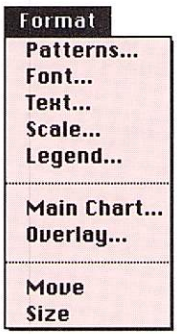
Formatting a chart involves adding chart objects (such as arrows and legends) and chart text, as well as changing its appearance with different patterns, styles, and text fonts. The commands you need for formatting a chart are on these three chart window menus (full menus shown):



The Gallery menu commands include many built-in options that are formatting shortcuts. Check these options before you customize a chart.



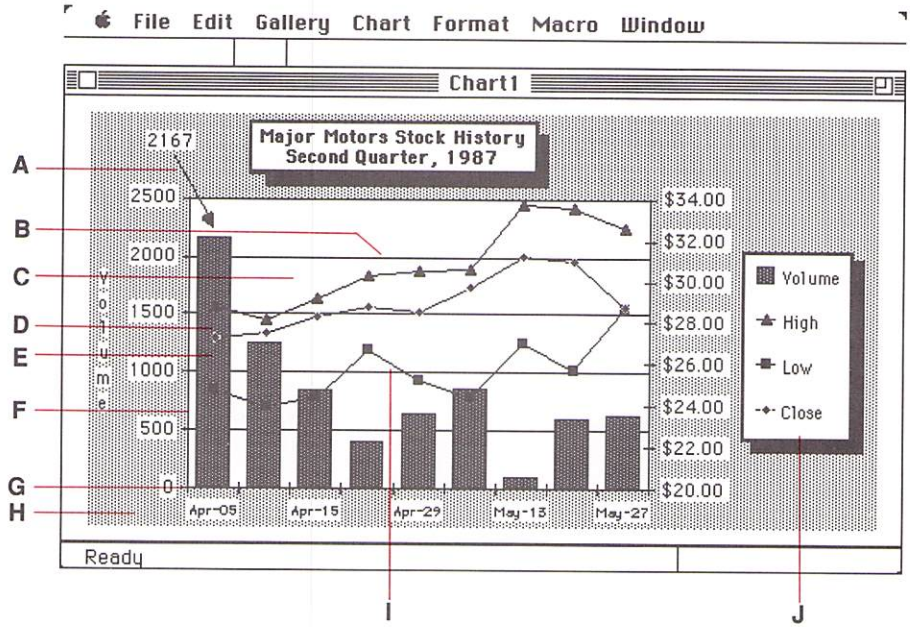
The Chart menu commands shown tinted here control the text and objects you add to a chart.



The Format menu commands control the styles, patterns, colors, sizes, and positions of chart text and chart objects.

For more information about each command, see the topic of the same name.

Adding or Formatting Chart Objects



Tip Double-clicking on many chart objects opens the Format dialog box for that item.

A To add a chart arrow:

- Choose Chart Add Arrow. To move arrow, drag arrow shaft; to size arrow, drag a black selection square.
- For step-by-step procedure, see **Chart arrow.**

To format a chart arrow:

- Select arrow and choose Format Patterns; select options from dialog box and click OK.
- For step-by-step procedure, see **Chart arrow.**

B To add major or minor chart gridlines:

- Choose Chart Gridlines; turn on check boxes for options in dialog box and click OK.
- For step-by-step procedure, see **Chart axis.**

To format chart gridlines:

- Select a gridline and choose Format Patterns; select options in dialog box and click OK.
- For more information on dialog box options, see **Format Patterns command.**

C To format chart plot area:

- Choose Chart Select Plot Area, then Format Patterns; select options in dialog box, and click OK.
- For step-by-step procedure, see **Chart plot area.**

D To format data series markers with the Stacked, 100%, Vary by Categories, Drop Lines, Hi-Lo Lines, Overlapped, or Cluster Spacing option:

- Choose Format Main Chart; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart data series.**

E To format data series marker's pattern, color, line weight, or border:

- Select the data series and choose Format Patterns; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart data series.**

F To format appearance of chart axes, tickmarks, and tickmark labels:

- Select category or value axis and choose Format Patterns; select options from dialog box and click OK.
- For step-by-step procedure, see **Chart axis.**

G To change the intersection of chart axes or make numeric adjustments in axes:

- Select value or category axis and choose Format Scale; specify the options and settings in dialog box and click OK.
- For step-by-step procedure, see **Chart axis.**

H To format chart background area:

- Choose Chart Select Chart, then Format Patterns; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart area.**

I To add an overlay chart to a chart (full menus):

- Choose Chart Add Overlay.
- For step-by-step procedure, see **Overlay chart.**

To format an overlay chart (full menus):

- Choose Format Overlay; select options in dialog box and click OK.
- For step-by-step procedure, see **Overlay chart.**

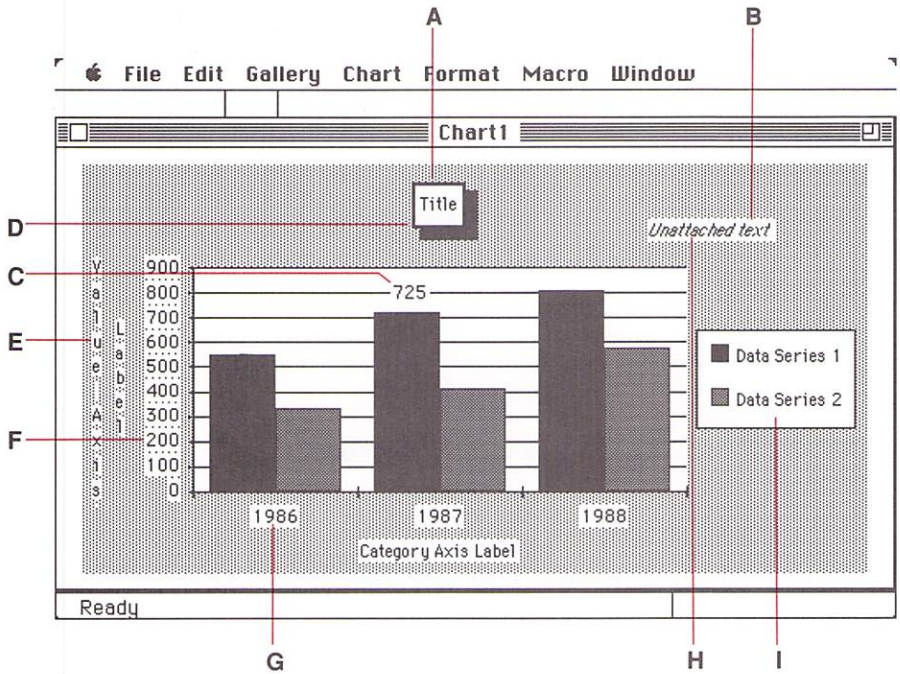
J To add a chart legend:

- Choose Chart Add Legend.
- For step-by-step procedure, see **Chart legend.**

To format chart legend background or border patterns, weights, or styles:

- Select legend and choose Format Patterns; select options from dialog box and click OK.
- For step-by-step procedure, see **Chart legend.**

Adding or Formatting Chart Text



A To add attached text to a chart:

- Choose Chart Attach Text; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart text.**

B To add unattached text to a chart:

- With no other text or data series selected, type text, and click enter box or press Enter.
- For step-by-step procedure, see **Chart text.**

To move or size unattached text:

- Select text. Move text by pointing inside area surrounded by selection squares and dragging text; size text by dragging a black selection square. Or with keyboard, choose Format Move or Format Size and use Direction keys to manipulate text.
- For step-by-step procedure, see **Chart text.**

C To add a data point label to a data series marker:

- Choose Chart Attach Text and click Series or Data Point option; in Series Number and Point Number boxes, type series number and data point number and click OK.
- For step-by-step procedure, see **Chart text.**

D To format background pattern or color, or border style, weight, or color for attached or unattached text:

- Select text and choose Format Patterns; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart text.**

E To format orientation and alignment of attached or unattached text:

- Select text and choose Format Text; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart text.**

F To change the number format used for value axis tickmark labels:

- Activate source worksheet window and select worksheet cells that were used for values in chart; choose Format Number, select a format, and click OK.
- For step-by-step procedure, see **Number.**

G To format font used for chart axis tickmark labels:

- Select category or value axis and choose Format Font; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart axis.**

H To format font, size, style, or color of attached or unattached text:

- Select text and choose Format Font; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart text.**

To format chart legend text, font, size, color, or style:

- Select the legend and choose Format Font; select options in dialog box and click OK.
- For step-by-step procedure, see **Chart legend.**

For information on editing chart text, see **Editing a document.**

Tip If you've customized a chart with several formatting changes and want to rework aspects of the chart, you don't necessarily have to start over. Use the Edit Clear command to:

- **Keep your data series but delete formatting changes.** Choose Chart Select Chart and then Edit Clear. Click the Formats option in the dialog box, and click OK.
- **Keep your formatting changes but delete data series.** Choose Chart Select Chart and then Edit Clear. Click the Formulas option in the dialog box, and click OK.

Related Information

Reference

For information on	See
Choosing commands and working in dialog boxes	Command, menu, and dialog box
Worksheet basics	Worksheet
Chart basics	Chart
Working with windows	Windows
Changing display options	Display options

Sampler

Changing Coordinate Systems

Formula

A **formula** is a sequence of values, cell references, names, functions, or operators that produces a new value from existing values. Formulas can be contained in a cell or associated with a name. Formulas are also used in charts to specify chart objects such as data series and labels. You enter a formula in the formula bar, just below the menu bar in the Microsoft Excel window.

This topic explains:

- The parts of a formula
- Entering a formula
- Canceling a formula

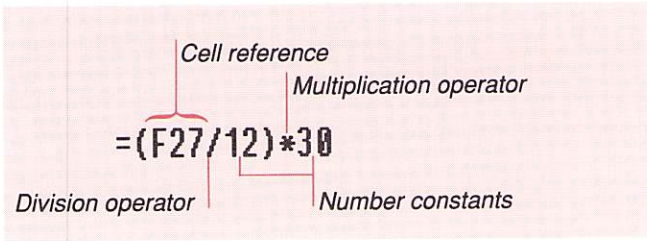
You also use the formula bar to enter data other than formulas in worksheet cells and in charts. This topic does not discuss the step-by-step procedures for using the formula bar. For information on using the formula bar, see **Formula bar.**

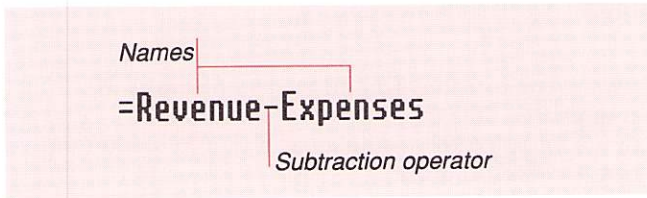
Note All procedures related to formulas in worksheets also apply to macro sheets.

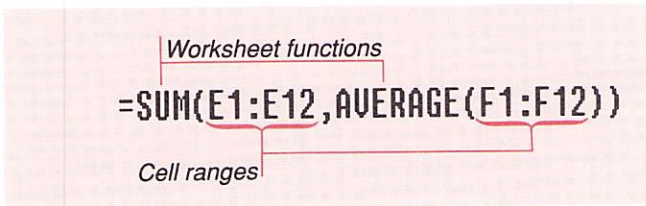
Parts of a Formula

A formula always begins with an equal sign (=) followed by a sequence of values, cell references, names, functions, or operators. The existing values can be constants entered as a part of the formula itself or values in other cells that are referenced or named in the formula. The operators and functions specify what calculations Microsoft Excel performs in the formula.

The following illustration shows the types of data you can include in a formula:







Microsoft Excel uses four kinds of operators:

Type of operator	Operators
Arithmetic	+ – / * % ^
Text	&
Comparison	= > < >= <= <>
Reference	: , space

For information on how the operators work, including the order in which operators are processed in a formula, see **Operator.**

Entering a Formula

When the formula bar is active, you can use the following techniques for entering a formula or part of a formula:

- **Type the formula.** You can type values, references, names, functions, and operators.
- **Select cells.** While the formula bar is active and in Enter mode (the status bar says "Enter"), you can select cells in the worksheet to insert references in your formula. To do this, select a cell or a range immediately after typing the equal sign to start the formula, or an operator, comma, or left parenthesis within a formula. The status bar indicates you are in Point mode, and a dotted marquee surrounds the cell or range you select. To exit Point mode, type another operator, comma, or left parenthesis, or complete the formula by pressing Enter or clicking the enter box. You can change the type of reference with the Formula Reference command. For information on how to select cells for formulas, see **Formula bar.**
- **Paste a function.** You can use the Formula Paste Function command to paste a built-in worksheet function. To do this, position the insertion point in the formula bar. Choose Formula Paste Function. Select the function you want from the list box. Click the OK button. For information on using functions, see **Function.**
- **Paste a name.** To paste a name, position the insertion point in the formula bar. Choose Formula Paste Name. Select the name you want to paste from the list box. Click the OK button. For information about using names, see **Names.**
- **Paste a link to another worksheet.** Linking lets you join the worksheets so that one worksheet depends on the values in another worksheet. For more information on the principles and procedures of linking, see **Linking documents.**

To enter a formula:

1. Click the cell in which you want to enter the formula.
2. Type an equal sign (=) to activate the formula bar.
   If you begin a formula by pasting a function or name, Microsoft Excel automatically inserts the equal sign.
3. Enter the formula, using any of the procedures discussed earlier.
4. Press Enter or click the enter box.
   If the status bar indicates that you are in Enter mode (and not in Edit or Point mode) and if the insertion point does not immediately follow an operator, comma, or left parenthesis, you can use a Direction key to enter the formula and move in the direction you want.

Canceling a Formula

While entering a formula or immediately after entering a formula, you can undo your entry and restore the previous contents of the cell.

To cancel a formula before you enter it	To undo a formula after you enter it
▣ Press Command+. (period) or click the cancel box.	▣ Choose Edit Undo.

Microsoft Excel cancels the formula and restores the previous contents of the formula bar.

Related Information

Reference

For information on	See
Editing formulas	Formula bar
Formulas used to plot charts	Series formula Chart data series
References	References Formula Reference command
Using names	Names Formula Paste Name command
Using built-in worksheet functions	Function Formula Paste Function command

Functions and Macros

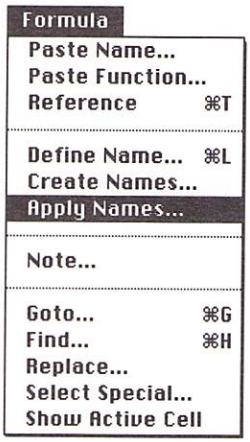
Chapter 1, "Introduction to Functions"

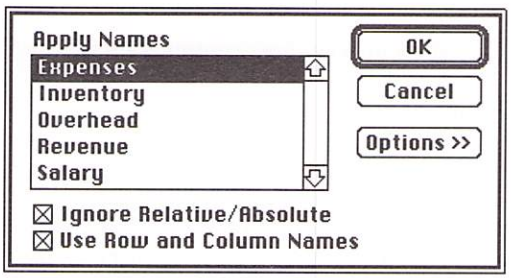
Chapter 2, "Worksheet Function Directory"

Formula Apply Names command

Searches through the formulas in the selected cells and replaces cell references with names, if they exist. If a single cell is selected when you choose Formula Apply Names, Microsoft Excel applies names to formulas in the entire worksheet.

Because names are more descriptive than references, you can use Formula Apply Names to quickly simplify and clarify the formulas in your worksheet. For information on names, see **Names.**





Apply Names Lists all names defined on your worksheet. Select the names you want Microsoft Excel to use in place of references. You can select as many names as you want by holding down the Shift key while clicking the names (notice the difference between this and the method for File Links multiple selection) or by holding down the Command key while pressing the Up Arrow or Down Arrow key to move the dotted box, and pressing the Spacebar to add the name to, or remove it from, the selection.

Ignore Relative/Absolute When this check box is turned on, Microsoft Excel replaces references with names regardless of the reference type of either the names or the references. If you turn off this check box, Microsoft Excel replaces absolute references only with absolute names, relative references only with relative names, and mixed references only with mixed names.

Since names are usually defined as absolute references, and references are usually entered into formulas as relative references, turning off this check box usually results in few names being applied. You should leave this check box turned on unless you plan to copy the cells to a new location and need to preserve the reference types in the formulas.

For information on absolute and relative references, see **References.**

Use Row and Column Names Uses the names of the ranges containing the referred-to cells if an exact match cannot be found.

If this check box is turned off, Microsoft Excel replaces only references that exactly match the definition of a name. If this check box is turned on, Microsoft Excel replaces all references that are exact matches, and then, for the remaining references, tries to find named ranges no more than one column wide or one row high that contain the cell referred to.

For example, if a formula contains a reference to cell A5, and you turn off this check box, A5 is only replaced by a name if the name is specifically defined as A5, $A$5, $A5, or A$5. If the check box is turned on, A5 is replaced by a name defined as any cell range that falls entirely within column A or entirely within row 5.

Three situations affect how Microsoft Excel changes references to names when there is not an exact match:

- The reference is to a cell in a different row and column from the cell containing the reference.

  If the reference is in a different row and column from the cell containing the reference, the reference is replaced with the names of the row-oriented range and the column-oriented range containing the cell. The two names appear in the formula one after the other, separated by a space, which is the intersection operator. If the reference is not within both a row-oriented and a column-oriented range, the reference is not replaced with a name.

- The reference is to a cell in the same row, but a different column from the cell containing the reference.

  If the reference is in the same row, but a different column, the reference is replaced with the column-oriented name, if there is one.

  If there is a column-oriented range and a row-oriented range containing the referenced cell, and if the Omit Row Name If Same Row check box is turned off, then the row name is also added. This check box, available when you click the Options button, is normally turned on.

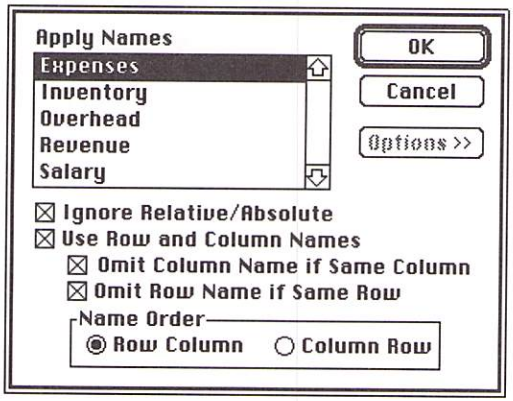
- The reference is to a cell in the same column, but a different row from the cell containing the reference.

  If the reference is in the same column, but a different row, the reference is replaced with the row-oriented name, if there is one.

  If there is a column-oriented range and a row-oriented range containing the referenced cell, and if the Omit Column Name If Same Column check box is turned off, then the column name is also added. The Omit Column Name check box, available when you click the Options button, is normally turned on.

Note For more information and for an example of how names are applied, see **Names.**

Options The Options button displays the options described below.



Omit Column Name If Same Column If the referenced cell is in the same column but a different row, and if the referenced cell is within a row-oriented named range, Microsoft Excel replaces the reference with the row-oriented name, but ignores the column-oriented name, if there is one.

Turn off this check box if you want the reference to be replaced with both the column name and the row name, if both exist.

Omit Row Name If Same Row If the referenced cell is in the same row but a different column, and if the referenced cell is within a column-oriented named range, Microsoft Excel replaces the reference with the column-oriented name, but ignores the row-oriented name, if there is one.

Turn off this check box if you want the reference to be replaced with both the column name and the row name, if both exist.

Name Order Determines which range name is listed first when a cell reference is replaced by a row-oriented range name and a column-oriented range name. Click the option you prefer.

Row Column	Lists the row name first
Column Row	Lists the column name first

Formula bar

The **formula bar** is the part of your Microsoft Excel window that you use to enter values and formulas into cells or charts.

This topic explains:

- Formula bar basics

  Entering data in the formula bar

  Canceling data in the formula bar

- Formula bar techniques

  Moving and selecting in the formula bar

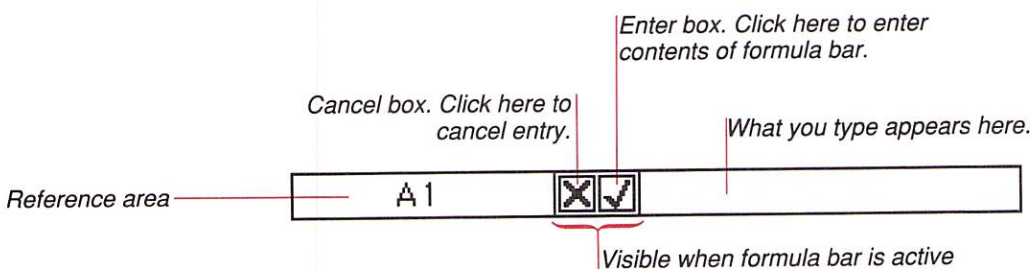
  Editing in the formula bar

  Inserting cell or range references in a formula

  Hiding or displaying the formula bar

Formula Bar Basics

Whenever you want to enter or change a value or formula in a document, you enter and edit it in the formula bar.


Enter box. Click here to enter contents of formula bar.
Cancel box. Click here to cancel entry.
What you type appears here.
Reference area
A1
Visible when formula bar is active

When a worksheet or macro sheet is the active document, the reference area displays the reference of the active cell. While you are selecting a range of cells, this area displays the size of the selected range. For example, if you have the range A1:B1 selected, you will see "1R x 2C" in the reference area. This tells you that the selected area is 1 row by 2 columns.

When a chart is the active document, the reference area tells you what is selected. If the legend is selected, for example, this area displays "Legend." If the third point of the first series is selected, this area displays "S1P3."

During certain operations, such as opening or saving a document or sorting a database, the reference area indicates the progress of the operation. Depending on the operation, Microsoft Excel indicates progress in percentage accomplished (such as "Sort: 80%") or in cells processed (such as "Recalc: 454").

Entering Data in the Formula Bar

To enter data in the formula bar, type the data. In addition, you can use any of the following techniques:

- Use the Formula Paste Name or Formula Paste Function command to paste names or worksheet functions into the formula bar. For more information, see **Function** and **Names.**
- Use the Edit Paste command to paste characters you previously copied or cut. For more information, see **Copying data and formats.**
- Use the keyboard or mouse to select cells and enter their references into the formula bar. For more information, see "Inserting Cell or Range References in a Formula," later in this topic.

Note Microsoft Excel formulas start with an equal sign (=). To enter a formula, make sure you type an equal sign before you type anything else.

To enter data:

1. Type or paste the data into the formula bar; or select cells to insert references.
2. Press Enter or click the enter box.

For step-by-step procedures for entering data in a single cell or range, or moving around in a selected range, see **Worksheet.**

Canceling an Entry in the Formula Bar

- Press Command+. (period) or click the cancel box.

Formula Bar Techniques

The following sections discuss techniques you can use to enter and edit data in the formula bar. Included is a procedure for hiding the formula bar to suppress the display of formulas in worksheets and charts.

Moving and Selecting in the Formula Bar

To work in the formula bar, use the techniques in this table to move the insertion point and to select the characters you want to work with:

To	Do this
Move in the formula bar	Click where you want the insertion point
Select characters in the formula bar	Drag through the characters you want
Select a word in the formula bar	Double-click the word you want

Editing in the Formula Bar

To edit data in the formula bar, first move the insertion point where you want or select the characters you want to work with (see the preceding section, "Moving and Selecting in the Formula Bar"). Then use the editing keys specified in the following tables. The first table lists standard editing keys. The second table lists special keys that enable you to insert times and dates, or copy data into the formula bar.

To use these keys, make sure Microsoft Excel is in Edit mode: from Ready or Enter mode, click the formula bar with the mouse or press Command + U. The left side of the status bar should display the message "Edit."

Key	With no characters selected	With characters selected
Command + X	—	Cuts the selection to the Clipboard
Backspace	Deletes the character to the left of the insertion point	Deletes the selection
Command + V	Pastes the Clipboard data at the insertion point	Pastes the Clipboard data over the selection
Command + C	—	Copies the selection to the Clipboard

Note When the formula bar is not active (that is, you cannot see the cancel and enter boxes), pressing Backspace activates the formula bar and deletes its contents.

Key	Action
Command+;	Inserts the current date in the formula bar
Command+:	Inserts the current time in the formula bar
Command+'	Copies the formula from the cell above into the formula bar
Command+"	Copies the value from the cell above into the formula bar

Inserting Cell or Range References in a Formula

When entering a formula, you can type cell or range references or you can use Point mode, a special mode that simplifies this procedure. This method is especially useful when you are working with the worksheet functions, many of which use ranges as arguments.

Follow these guidelines to use Point mode:

- **When to use Point mode.** You can use Point mode only from Enter or Edit mode and only when entering a formula. If the status bar displays "Ready," turn on Enter mode by typing an equal sign.
- **Where to insert references with Point mode.** You can use Point mode to insert a cell or range reference immediately following any of these elements in a formula: an equal sign, a left parenthesis, a comma, or an operator (for example, +, −, *, or /).
- **How to insert a reference.** Immediately following any of the elements listed above, click the cell or drag through the range of cells whose reference you want to insert in the formula. The cell or range you select is surrounded by a dotted line called a **marquee.** The reference to the cell or range appears in the formula bar.
- **How to continue the formula after inserting a reference.** After you insert the reference in the formula, type the next operator, comma, or parenthesis. Or, complete the formula by pressing Enter or clicking the enter box.

For more information on entering a formula or using worksheet functions, see **Formula** and **Function,** respectively. For more information on modes in Microsoft Excel, see **Worksheet.**

Hiding or Displaying the Formula Bar

Normally, Microsoft Excel displays the formula bar. If you want, you can hide the formula bar. Then, when you type data into a cell, you will see the data in that cell but not in the formula bar. After you've entered a formula, the formula will not be visible anywhere on the worksheet.

To hide the formula bar	To display the formula bar
1 Choose Options Workspace.	1 Choose Options Workspace.
2 Turn off the Formula Bar check box.	2 Turn on the Formula Bar check box.

For information on hiding formulas for security purposes, see **Protecting or hiding data.**

Related Information

Reference

For information on	See
Formulas	Formula
Selecting with the keyboard	Keyboard
Editing in worksheets and charts	Editing a document

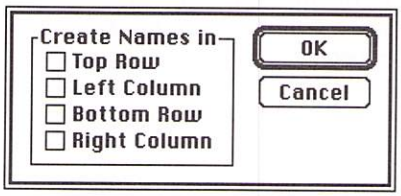
Formula Create Names command

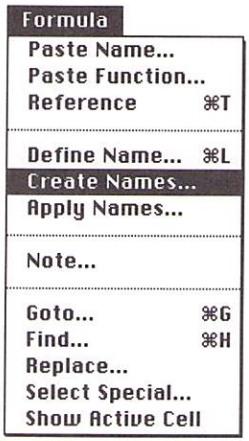
(Full Menus)

Quickly names several areas of a worksheet at once by using text at the edge of the area you want to name.

When you select the range of cells you want to name, include the text to be used as names in the left or right column, the top or bottom row, or some combination of these; then choose Formula Create Names.

You can use any combination of options to create names in any direction. If you use two options that overlap, such as the top row and left column, and the cell in the corner of the selection contains text, that text also becomes the name for the entire selected range.





Top Row The text in each cell of the top row of the selection becomes the name for the column below it.

Left Column The text in each cell of the left column of the selection becomes the name for the row to the right of it.

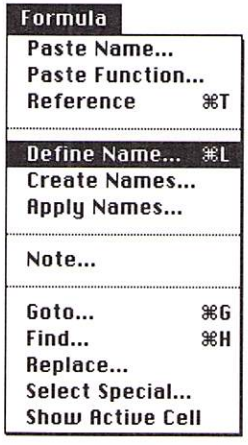
Bottom Row The text in each cell of the bottom row of the selection becomes the name for the column above it.

Right Column The text in each cell of the right column of the selection becomes the name for the row to the left of it.

When you click the OK button, Microsoft Excel creates the names. If any of the names are already defined, Microsoft Excel asks if you want to change the existing definition of the name.

Yes	Gives the name the new definition
No	Keeps the current definition of the name, and leaves the cells that would have been affected unnamed
Cancel	Ends the command, but retains any names already defined before you clicked the Cancel button

Formula Define Name command



Creates a name for a cell range, value, or formula. You can create, delete, or change a name with Formula Define Name. You can use a name in formulas or other name definitions.

You can also use Formula Define Name to define values or formulas that aren't in cells. For example, you can define Inflation without putting the value for Inflation in a cell. To do so, choose Formula Define Name, type *Inflation* in the Name box, and type the current rate of inflation in the Refers To box. You can then include the name Inflation in any formula, and Microsoft Excel uses the value you typed in the Refers To box.

You can change the rate of inflation as often as you want by changing the value for Inflation in the Refers To box. Every time you change that value, Microsoft Excel updates all formulas that contain the name Inflation.

Define a name by accepting the proposed name or typing a new one, accepting or changing what the name refers to, and then clicking the OK button.

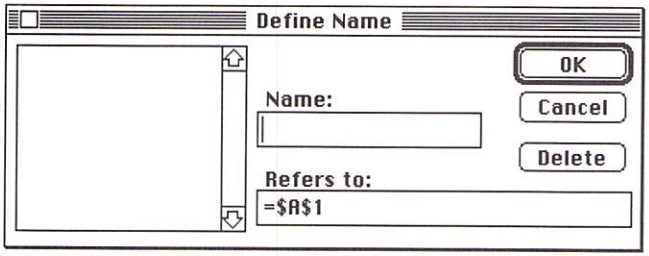
The first character of any name must be a letter. Names can be up to 255 characters long, and can contain any letter or digit, an underline (_), or a period. A name cannot contain spaces; use the underline character instead. Microsoft Excel does not accept names that resemble a number or cell reference.

You can name a cell range containing any number of cells. You can also name a multiple selection.

If the Formula Define Name dialog box is covering a cell you want to select, you can move the dialog box by dragging the title bar.

For more information, see **Names.**

Worksheet



The list box lists all names currently defined on the worksheet. If you select a name from this list, the name appears in the Name box, and whatever the name refers to is shown in the Refers To box.

Name If there is text in the active cell, Microsoft Excel proposes that text as the name. If the active cell is blank, Microsoft Excel proposes text in the cell to the left or above as the name.

You can accept the proposed name, select one of the names in the list box, type a new name, or edit the proposed name. You edit a name in the Name box the same way you edit text in the formula bar.

If you use a name that you have already defined, the new definition of the name completely replaces the old definition.

Refers To If you are defining a new name, Microsoft Excel proposes the selected cell range. If the name is already defined, Microsoft Excel proposes the range, value, or formula that the name currently refers to.

You edit the contents of the Refers To box the same way you edit the contents of the formula bar. While you are editing, you can make worksheet selections, choose formula editing commands, and activate and move windows.

The Refers To box accepts cell references, values, or formulas. Formulas can include other names, functions, and references. For example:

=Inflation/2

=Gross – Taxes

=$A$2 – $A$1

Delete Deletes the name selected in the list box.

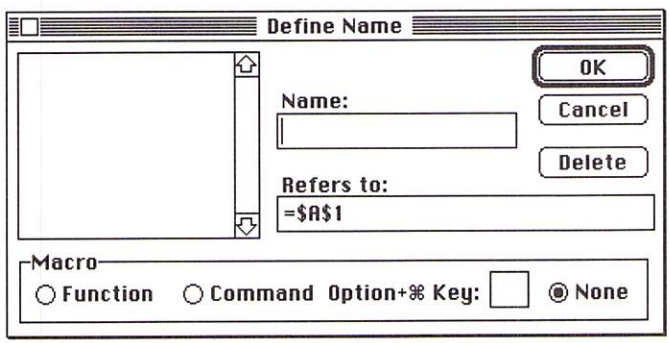
Note If the name in the Name box is different from the name selected in the list box, the Delete button deletes only the name entered in the Name box.

When you delete a name, the named cells and their contents are not affected; you remove just the name. Any cell containing a formula that uses a deleted name displays #NAME? as its value.

Macro Sheet

If you choose Formula Define Name when a macro sheet is active, you will see a slightly different dialog box. This dialog box is the same as the worksheet dialog box except for the Macro options.

For information on macros, see *Microsoft Excel Functions and Macros.*



Macro When you define a macro name, select either Function or Command to define the type of macro it is. For a command macro, you can also assign a shortcut key that you press with the Command and Option keys to run the macro. The shortcut key can be any uppercase or lowercase letter except *e, i, n,* or *u.* The shortcut key cannot be a number.

Formula Find command

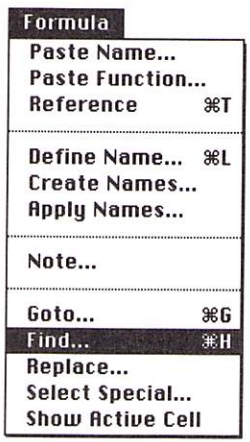
Locates text or a number in a cell.

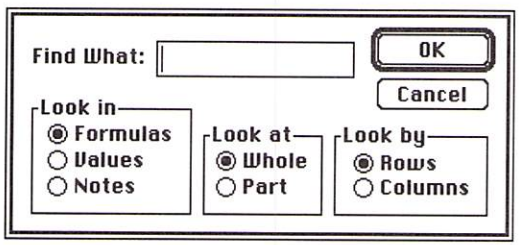
Use Formula Find to find all occurrences of a name or function. For example, Formula Find is particularly useful for finding #REF! and #NAME? error values caused by deleting cells or names. To find specific records in a database, use the Data Find command.

If you select a range of cells, Formula Find searches only within that selection. If only one cell is selected, Formula Find searches the entire worksheet.

When you have set all the options in the dialog box, click the OK button to find the next occurrence. To search for the previous occurrence, hold down Shift when you click the OK button.

For more information, see **Finding cells and data quickly.**





Find What Proposes the last text or number searched for. You can either accept the proposed response or type in a new one. The value may include the characters =, >, <, >=, <=, and <>, but they are treated as text, not as operators.

The characters ? and * are treated as wildcards. A question mark stands for any single character, and an asterisk stands for any group of characters. For more information on wildcard characters and comparison operators, see **Operator.**

If you want to find a question mark or asterisk, precede it with a tilde (~). For example, *to?* finds all three-letter words that begin with the letters *to,* while *to~?* finds all occurrences of *to?.*

Look In

Formulas	Searches the contents of each cell as displayed in the formula bar
Values	Searches the formatted value displayed in each cell
Notes	Searches the text of the note for each cell

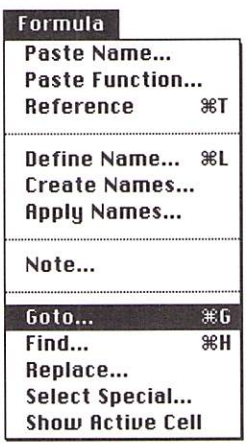
Look At

Whole	Matches the text or number you want to find with the entire value, formula, or note in the cell
Part	Matches the text or number you want to find with any part of the value, formula, or note in the cell

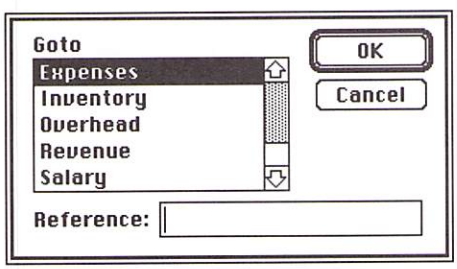
Look By

Rows	Searches horizontally through rows
Columns	Searches vertically through columns

Formula Goto command



Quickly scrolls the worksheet and selects a named area or a reference. You can select a name from the list box or type a name or reference in the Reference text box.



Goto Lists all the names defined in the active worksheet. Select a name from the list and click the OK button.

Reference Specifies the named area or reference. Type a name or reference and click the OK button.

To go to a named area or a reference on another worksheet, type the name of the worksheet, an exclamation point, and the reference or name. For example, to go to B3 on a worksheet named Budget, type *Budget!B3*

Going Back

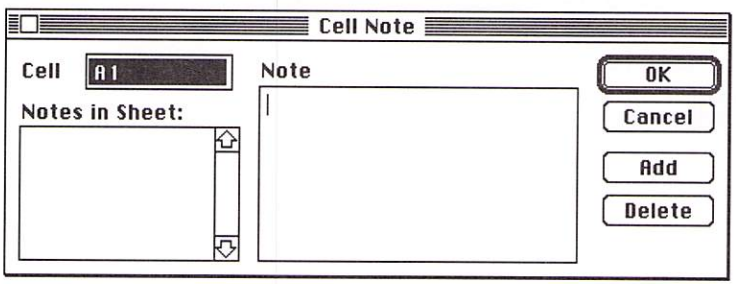
Each time you use Formula Goto to go to another part of the worksheet, Microsoft Excel remembers where you were and automatically puts that last cell reference in the Reference text box the next time you choose the command. You can toggle back and forth between two parts of your worksheet by repeatedly choosing Formula Goto.

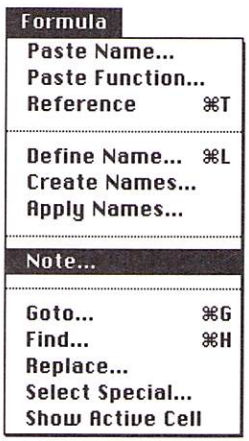
Formula Note command

Lets you attach extra information to a cell. You can add, delete, and edit notes for specific cells on the active worksheet.

Notes do not appear in the cell, but can be printed with the worksheet or viewed in the Info window with the Window Show Info command.

For more information on notes, see **Notes.**





Cell Gives the cell reference for the note selected in the Notes in Sheet list box.

Notes in Sheet Lists all notes on the worksheet, preceded by each note's cell reference.

Note Shows the complete text of the note selected in the Notes in Sheet list box. You can edit this text the same way you edit text and formulas in the formula bar.

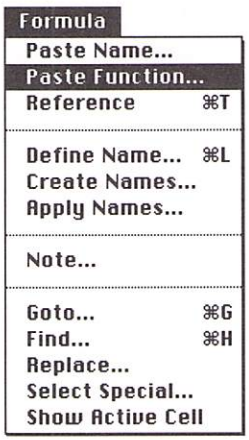
Add Adds the text in the Note box to the cell in the Cell box. The Add button does not close the dialog box, so you can continue adding or editing other notes.

Delete Deletes the note selected in the Notes in Sheet list box. The cell the note was attached to is unaffected.

OK Adds any text in the Note box to the cell in the Cell box, and closes the dialog box.

Cancel Closes the dialog box, but does not cancel your actions. Any notes you have added, edited, or deleted remain as you changed them.

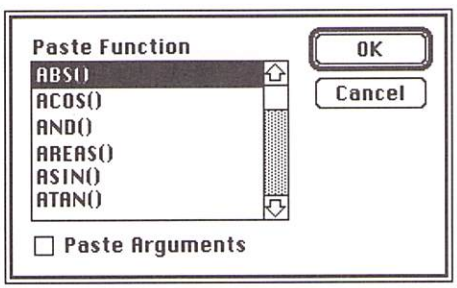
Formula Paste Function command



Pastes a function into the formula bar. If the formula bar is active, the function is pasted at the insertion point. If the formula bar is not active, the formula bar is activated and the function pasted into it.

It is usually more accurate to paste a function than to type it. Pasting a function also provides an easy way to remember which functions are available and what their arguments are, especially if you use the Paste Arguments check box.

For a quick-reference list of functions and their arguments, see **Function.** For a complete list of functions, their arguments, and what they do, see *Microsoft Excel Functions and Macros.*

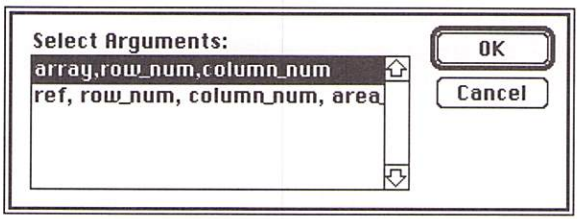


Paste Function Lists all available Microsoft Excel functions, followed by any function macros defined on open macro sheets. A function macro is preceded by the name of its macro sheet and an exclamation point.

To paste a function, select the function you want from the list, and then click the OK button. Scroll the list box to see the entire list of functions.

Paste Arguments If this check box is turned on, Microsoft Excel pastes text descriptions of the function's arguments into the formula bar along with the function. You must replace these argument placeholders with the actual arguments you want to use.

Some functions, such as the Index function, have more than one form. If you paste a function that has more than one form while the Paste Arguments check box is turned on, Microsoft Excel displays another dialog box so you can select the form you want to paste.



Select Arguments Lists the sets of arguments available for the function you selected. Select the set you want and click the OK button.

Formula Paste Name command

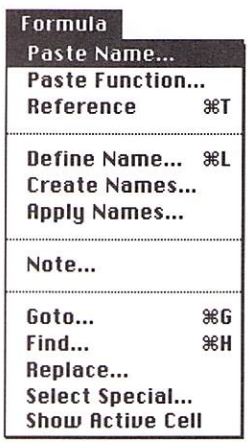
Pastes a name into the formula bar. You can also paste into your worksheet a list of all names defined for the worksheet and what they refer to.

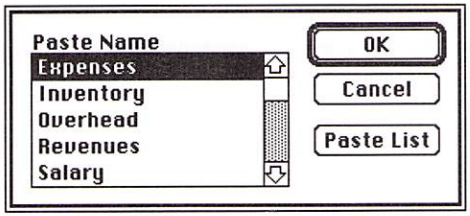
If the formula bar is active, the name is pasted at the insertion point. If the formula bar is not active, the formula bar is activated and the name pasted into it.

Formula Paste Name is particularly useful when you construct large worksheets because you can refer to areas of your worksheet without having to remember specific cell references, and you don't have to worry about mistyping a name. Use Formula Paste Name both to remember what names you have defined and to paste them into the formula bar.

The command is grayed if there are no names defined on the current worksheet. Use the Formula Define Name or Formula Create Names command to define names.

For more information, see **Names.**





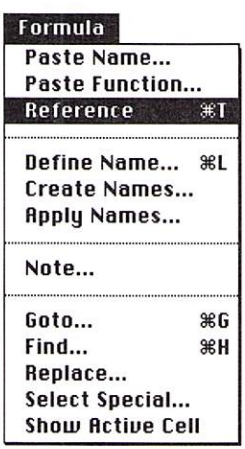
Paste Name Lists all names defined on the active worksheet. Select the name you want to paste and click the OK button.

Paste List Lists all names defined on your worksheet. When you click the Paste List button, Microsoft Excel starts at the active cell and fills an area two columns wide and as many rows long as there are names. The left column lists the names defined on the worksheet and the right column lists what the names refer to.

In a macro sheet, the list is four columns wide. The first column lists the names defined on the macro sheet, the second column lists what the names refer to, the third column contains a "1" to indicate the name is for a function macro or a "2" to indicate the name is for a command macro, and the fourth column lists the shortcut key you can use to run the macro.

Important When you click the Paste List button, Microsoft Excel completely replaces the contents of the cells it pastes into. If you mistakenly paste the list of names into a part of your worksheet containing data you want to keep, immediately choose the Edit Undo command.

Formula Reference command



Converts the selected references in the formula bar from relative to absolute, from absolute to mixed, and from mixed back to relative.

Formula Reference converts a reference in the formula bar if you have selected the reference, or if the insertion point is within or next to the reference. You can select and convert as many references in the formula bar as you want.

The following table shows how selected cell references are converted when you choose Formula Reference:

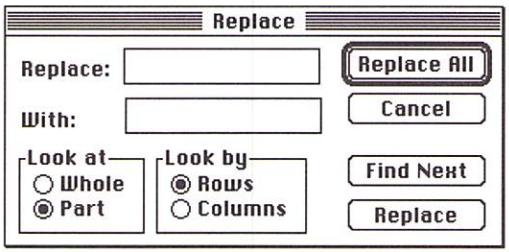
This	Becomes
A1	$A$1
$A$1	A$1
A$1	$A1
$A1	A1

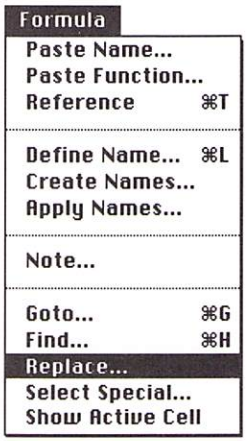
For more information, see **References.**

Formula Replace command

(Full Menus)

Finds and replaces characters in the cells on your worksheet. If you select a cell range, Microsoft Excel searches only that range. If you select a single cell, Microsoft Excel searches the entire worksheet.





Replace Microsoft Excel proposes the last characters you searched for. Accept the proposed response or type the text, number, formula, or part of a formula that you want to find.

You can include the question mark and asterisk wildcards in the Replace text box. For more information, see **Wildcard.**

With Microsoft Excel proposes the last characters you used as a replacement. Accept the proposed response or type the text, number, formula, or part of a formula that you want to use as the replacement.

Look At

Whole	Matches the characters you want to find with the entire formula or value in the cell
Part	Matches the characters you want to find with any part of the formula or value in the cell

Look By

Rows	Searches horizontally through rows
Columns	Searches vertically through columns

Replace All Finds and replaces all occurrences of the characters in the Replace box with the characters in the With box.

Cancel Ends the command and closes the dialog box, but does not reverse any replacements made up to the time you cancel.

Find Next Finds the next occurrence of the characters in the Replace box. You can find the previous occurrence by holding down Shift when you click Find Next. When you are at the last occurrence, Microsoft Excel finds the first occurrence in the worksheet. When there are no occurrences at all in the worksheet, Microsoft Excel displays a message.

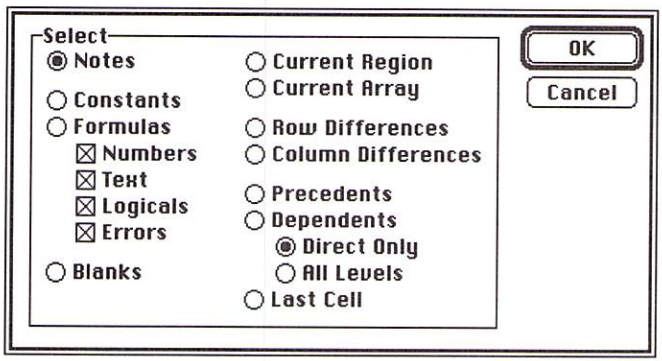
Replace If the active cell contains what you are searching for, Microsoft Excel replaces it, and looks for the next occurrence. When you are at the last occurrence, Microsoft Excel finds the first occurrence in the worksheet. When there are no occurrences at all in the worksheet, Microsoft Excel displays a message.

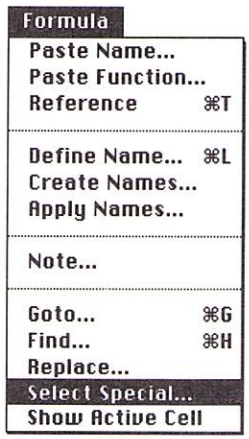
Formula Select Special command

(Full Menus)

Selects cells that have the characteristics specified in the dialog box.

The selection that results from Formula Select Special can contain many cells and cell ranges. To move to individual cells within a selected range, press Tab or Enter; to move in the opposite direction, press Shift + Tab or Shift + Enter. To move between selected ranges, press Command + Tab or Shift + Command + Tab.





Notes Makes a multiple selection of all cells that contain a note. For information on notes, see **Notes** and **Formula Note command.**

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Constants Makes a multiple selection of cells that contain a constant, based on which check boxes you turn on or off. You can have any combination of the four check boxes turned on or off. The check boxes under Formulas also control constants when Constants is selected. A constant is a number or text that does not start with an equal sign.

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Numbers	Selects constant numbers
Text	Selects constant text
Logicals	Selects the logical values TRUE and FALSE that have been entered in the cell as constants, rather than as the result of a formula
Errors	Selects cells containing error values that have been entered in the cell as constants, rather than as the result of a formula

Formulas Makes a multiple selection of cells that contain a formula, based on which check boxes you turn on or off. You can have any combination of the four check boxes turned on or off. The check boxes also control constants when Constants is selected.

Except for some special formulas in macro sheets, a formula starts with an equal sign and produces a value. For information on formulas, see **Formula.**

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Numbers	Selects cells with formulas that produce numbers
Text	Selects cells with formulas that produce text
Logicals	Selects cells with formulas that produce the logical values TRUE or FALSE
Errors	Selects cells with formulas that produce an error value

Blanks Makes a multiple selection of all cells that are blank. If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Current Region Selects a rectangular range of cells around the active cell. The region selected is an area bounded by any combination of blank rows, blank columns, or worksheet borders.

Current Array Selects the entire array to which the active cell belongs, if any. For information on arrays, see **Array.**

Row Differences Searches each row of the selection and selects the cells that are different from the comparison cell in each row. The comparison cell for each row is the cell that is in the same column as the active cell. The selection can be a cell range or a multiple selection, and the active cell can be inside or outside the selection.

Microsoft Excel determines how to select row differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells, which are the basis for finding row differences. When searching for row differences, Microsoft Excel compares the cells in the selection to the cells in the same column as the active cell. The active cell, and thus the comparison cells, can be inside or outside the selection.
- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each row that are different from the comparison cell in the column containing the active cell, and makes a multiple selection of all the cells that are different.

Microsoft Excel compares formulas based on the R1C1 reference style, which shows relative references more clearly than the A1 reference style. This way, cells with identical relative references will not be selected as being different.

For example, if the active cell is D2 and contains the formula =E2, the identical relative reference in cell D3 would be =E3, since each refers to the cell to the right of it. The similarity is clearer in R1C1 style, since both cells would contain the formula =RC[1]. The result is that Microsoft Excel correctly considers the formulas in cells D2 and D3 to be the same. For information on R1C1 reference style, see **References** and **Options Workspace command.**

Column Differences The Column Differences option works like the Row Differences option, except that it selects cells in the same column that are different from the comparison cells rather than cells in the same row that are different.

Microsoft Excel determines how to select column differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells, which are the basis for finding column differences. When searching for column differences, Microsoft Excel compares the cells in the selection to the cells in the same row as the active cell. The active cell, and thus the comparison cells, can be inside or outside the selection.
- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each column that are different from the comparison cell in the row containing the active cell, and makes a multiple selection of all the cells that are different.

Microsoft Excel compares formulas based on the R1C1 reference style, which shows relative references more clearly than the A1 reference style. This way, cells with identical relative references will not be selected as being different.

For example, if the active cell is C2 and contains the formula =C1, the identical relative reference in cell B2 would be =B1, since each refers to the cell above it. The similarity is clearer in R1C1 style, since both cells would contain the formula =R[−1]C. The result is that Microsoft Excel correctly considers the formulas in cells B2 and C2 to be the same. For information on R1C1 reference style, see **References** and **Options Workspace command.**

Precedents Selects cells that the formulas in the selected cells refer to. For information on what level of precedents Microsoft Excel selects, see "Direct Only" and "All Levels," following.

Dependents Selects cells with formulas that refer to the selected cells. For information on what level of dependents Microsoft Excel selects, see "Direct Only" and "All Levels," following.

Direct Only When you search for precedents, Direct Only selects only the cells that the formulas in the selection directly refer to. When you search for dependents, Direct Only selects only the cells containing formulas that directly refer to the cells in the selection.

All Levels When you search for precedents or dependents, All Levels selects all cells that are directly and indirectly connected to the cells in the selection.

For example, if you select Precedents and All Levels, Microsoft Excel selects the cells referred to by the cells in the selection, the cells that those cells refer to, and so on.

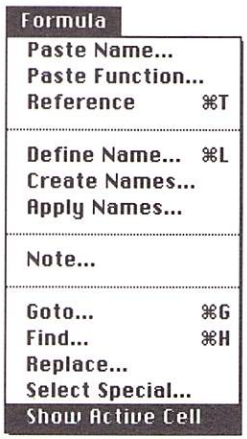
All Levels is especially useful for selecting the entire network of cells that depend on or affect a particular cell in a complex worksheet.

Last Cell Selects the cell at the intersection of the rightmost column and bottommost row that contain data or formatting.

Formula Show Active Cell command

(Full Menus)

Scrolls the worksheet until the active cell is visible. This command is useful if you scroll the worksheet away from the active cell and want to return to it quickly.



Function

A **function** is a special prewritten formula that operates on a value or values and returns a value or values. Functions can be used alone or as building blocks in other formulas. Using functions can simplify and shorten formulas in your worksheets, especially those that perform lengthy or complex calculations.

Microsoft Excel has a set of built-in worksheet functions that serve as shortcuts for many worksheet computations. In addition, you can create your own functions for specialized calculations you routinely perform. Such functions are called **function macros.**

This topic provides a brief introduction to the Microsoft Excel built-in worksheet functions. It explains:

- Overview of worksheet functions
- How to use functions

  Function arguments

  Pasting a worksheet function

- The Microsoft Excel built-in worksheet functions

For a brief overview of function macros, see **Macro.** For complete information on both types of functions, see *Microsoft Excel Functions and Macros.*

Overview of Worksheet Functions

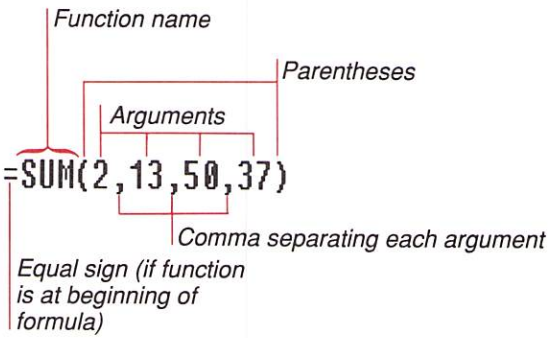
You use the Microsoft Excel built-in worksheet functions to perform standard worksheet and macro sheet computations. The values that you give to a function to operate on are called **arguments**. The values that the function returns are called **results**.

Here are some examples of commonly-used worksheet functions and what they do:

This function	Performs this action
SUM(1,2,3)	Adds 1, 2, and 3 and returns 6
AVERAGE(1,2,3)	Calculates the average of 1, 2, and 3 and returns 2
SIN(0.53)	Calculates the sine of an angle of 0.53 radians and returns 0.50553334
LEN("Isabel Corley")	Counts the number of characters in the text Isabel Corley and returns 13

How to Use Functions

You use functions by entering them in formulas on worksheets or macro sheets. The sequence of characters you use in a function is called the **syntax** of the function. All functions have the same basic syntax, as in this example:



The parentheses are important. They tell Microsoft Excel where the arguments begin and end. Whenever you type a function in the formula bar, remember to include both parentheses, with no space preceding the left parenthesis. If you do not follow this syntax, Microsoft Excel displays a message indicating that there is an error in the formula. One easy way to enter a function and avoid syntax errors is to paste the function in the formula bar using the Formula Paste Function command, explained later in this topic.

When entering functions, you can type uppercase or lowercase letters or a combination of both. Microsoft Excel does not distinguish between cases in function names.

Function Arguments

Function arguments can be any of the following data types: numbers, text, logical values, arrays, error values, or references. Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros* specifies what data type each argument should be. You can give any argument that produces the desired data type, such as a reference or name.

Pasting a Worksheet Function

An easy way to enter a function is to paste it.

1. Select the cell or cells in which you want to paste the function.
2. Choose Formula Paste Function.
   Microsoft Excel displays a dialog box that lists all the built-in worksheet functions. If you created your own functions (function macros), these appear at the end of the list.
3. Select the function you want.

   Tip If you want Microsoft Excel to paste placeholders to remind you of what arguments are needed for the function, turn on the Paste Arguments check box. If you paste placeholders, you need to replace them with actual arguments.

4. Click the OK button.
5. Type or edit the arguments.
   If there's more than one argument, separate them with commas.
6. When you finish editing the formula, press Enter or click the enter box.

Microsoft Excel Built-in Worksheet Functions

This section lists the Microsoft Excel built-in worksheet functions and their arguments. The functions are arranged by the following categories and appear in alphabetical order within each category:

- Database functions
- Date functions
- Financial functions
- Information functions
- Logical functions
- Lookup functions
- Mathematical functions
- Matrix functions
- Statistical functions
- Text functions
- Trigonometric functions

Function listings use the following conventions:

- *Italics* indicate optional arguments within a function.
- An ellipsis (...) indicates an argument that can be repeated.

For thorough explanations and examples of worksheet functions, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros.*

Database Functions

DAVERAGE(database,field,criteria)
Average of numbers in specified *field* of records in *database* that match *criteria*

DCOUNT(database,field,criteria)
Count of numbers in specified *field* of records in *database* that match *criteria*

DCOUNTA(database,field,criteria)
Count of nonblank cells in specified *field* of records in *database* that match *criteria*

DMAX(database,field,criteria)
Maximum of numbers in specified *field* of records in *database* that match *criteria*

DMIN(database,field,criteria)
Minimum of numbers in specified *field* of records in *database* that match *criteria*

DPRODUCT(database,field,criteria)
Product of numbers in specified *field* of records in *database* that match *criteria*

DSTDEV(database,field,criteria)
Estimates standard deviation of a population based on a sample, using numbers in specified *field* of records in *database* that match *criteria*

DSTDEVP(database,field,criteria)
Standard deviation of a population, based on the entire population, using numbers in specified *field* of records in *database* that match *criteria*

DSUM(database,field,criteria)
Sum of numbers in specified *field* of records in *database* that match *criteria*

DVAR(database,field,criteria)
Estimates variance of a population based on a sample, using numbers in specified *field* of records in *database* that match *criteria*

DVARP(database,field,criteria)
Variance of a population, based on the entire population, using numbers in specified *field* of records in *database* that match *criteria*

Date Functions

DATE(year,month,day)
Serial number of specified date

DATEVALUE(date_text)
Serial number of *date_text*

DAY(serial_number)
Converts *serial_number* to a day of the month

HOUR(serial_number)
Converts *serial_number* to an hour of the day

MINUTE(serial_number)
Converts *serial_number* to a minute

MONTH(serial_number)
Converts *serial_number* to a month of the year

NOW( )
Returns the *serial_number* of current date and time

SECOND(serial_number)
Converts *serial_number* to a second

TIME(hour,minute,second)
Serial number of specified time

TIMEVALUE(time_text)
Serial number of time specified by *time_text*

WEEKDAY(serial_number)
Converts *serial_number* to a day of the week

YEAR(serial_number)
Converts *serial_number* to a year

Financial Functions

DDB(cost,salvage,life,period)
Depreciation of an asset, using the double-declining balance method

FV(rate,nper,pmt,*pv,type*)
Future value of investment

IPMT(rate,per,nper,pv,*fv,type*)
Interest payment for an investment

IRR(values,*guess*)
Internal rate of return of *values*

MIRR(values,finance_rate,reinvest_rate)
Modified internal rate of return of *values*

NPER(rate,pmt,pv,*fv,type*)
Number of payments of investment

NPV(rate,value1,*value2,...*)
Net present value of *values*

PMT(rate,nper,pv,*fv,type*)
Periodic payment of investment

PPMT(rate,per,nper,pv,*fv,type*)
Payment on the principal for an investment

PV(rate,nper,pmt,*fv,type*)
Present value of investment

RATE(nper,pmt,pv,*fv,type,guess*)
Rate returned on investment

SLN(cost,salvage,life)
Straight-line depreciation for an asset

SYD(cost,salvage,life,per)
Sum-of-years' digits depreciation for an asset

Information Functions

AREAS(reference)
Number of areas in *reference*

CELL(type_of_info,*reference*)
Information about formatting, location, or contents of *reference*

COLUMN(*reference*)
Column numbers in *reference*

COLUMNS(array)
Number of columns in *array*

INDIRECT(ref,*type_of_ref*)
Contents of the cell from its *ref*

ISBLANK(value)
True if *value* is blank

ISERR(value)
True if *value* is any error value except #N/A

ISERROR(value)
True if *value* is any error value

ISLOGICAL(value)
True if *value* is a logical value

ISNA(value)
True if *value* is the error value #N/A

ISNONTEXT(value)
True if *value* is not text

ISNUMBER(value)
True if *value* is a number

ISREF(value)
True if *value* is a reference

ISTEXT(value)
True if *value* is text

N(value)
Value translated into a number

NA( )
Error value #N/A

ROW(*reference*)
Row numbers in *reference*

ROWS(array)
Number of rows in *array*

T(value)
Value translated into text

TYPE(value)
Type of *value*

Logical Functions

AND(logical1,*logical2,...*)
TRUE if every argument is TRUE; otherwise, FALSE

FALSE( )
Logical value FALSE

IF(logical_test,value_if_true,*value_if_false*)
Value_if_true if *logical_test* is TRUE; *value_if_false* if *logical_test* is FALSE

NOT(logical)
TRUE if *logical* is FALSE; FALSE if *logical* is TRUE

OR(logical1,*logical2,...*)
TRUE if any argument is TRUE; otherwise, FALSE

TRUE( )
Logical value TRUE

Lookup Functions

CHOOSE(index_number,value1,*value2*,...)
Uses *index_number* to select a value from *values*

HLOOKUP(lookup_value,table_array,row_index_num)
Value in a table selected by *lookup_value*

INDEX(ref,row_num,column_num,*area_num*)
INDEX(array,row_num,column_num)
Reference in *ref* or value in *array* selected by index values

LOOKUP(lookup_value,lookup_vector,result_vector)
LOOKUP(lookup_value,array)
Value in a table selected by *lookup_value*

MATCH(lookup_value,lookup_ref,*type_of_match*)
Number of a value selected by *lookup_value*

VLOOKUP(lookup_value,table_array,col_index)
Value in a table selected by *lookup_value*

Mathematical Functions

ABS(number)
Absolute value of *number*

EXP(number)
e to the power *number*

FACT(number)
Factorial of *number*

INT(number)
Number rounded down to the nearest integer

LN(number)
Natural logarithm of *number*

LOG(number,*base*)
Logarithm of *number* in base *base*

LOG10(number)
Base 10 logarithm of *number*

MOD(number,divisor_number)
Remainder of *number* divided by *divisor_number*

PI()
Value of π

PRODUCT(number1,*number2*,...)
Product of *numbers*

RAND()
Random number between 0 and 1

ROUND(number,number_of_digits)
Rounds *number* to *number_of_digits* digits

SIGN(number)
Sign of *number*

SQRT(number)
Square root of *number*

TRUNC(number)
Integer part of *number*

Matrix Functions

MDETERM(array)
Determinant of *array*

MINVERSE(array)
Inverse of *array*

MMULT(array1,array2)
Product of two *arrays*

TRANSPOSE(array)
Transpose of *array*

Statistical Functions

AVERAGE(number1,*number2,...*)
Average of *numbers*

COUNT(value1,*value2,...*)
Count of numbers in *values*

COUNTA(value1,*value2,...*)
Count of values in *values*

GROWTH(known_y's,*known_x's,new_x's*)
Values on exponential trend

LINEST(known_y's,*known_x's*)
Parameters of linear trend

LOGEST(known_y's,*known_x's*)
Parameters of exponential trend

MAX(number1,*number2,...*)
Maximum number in *numbers*

MIN(number1,*number2,...*)
Minimum number in *numbers*

STDEV(number1,*number2,...*)
Estimates standard deviation of a population based on a sample

STDEVP(number1,*number2,...*)
Standard deviation of a population based on the entire population

SUM(number1,*number2,...*)
Sum of *numbers*

TREND(known_y's,*known_x's*,*new_x's*)
Values on linear trend

VAR(number1,*number2,...*)
Estimates variance of population based on a sample

VARP(number1,*number2,...*)
Variance of a population based on the entire population

Text Functions

CHAR(number)
ASCII character corresponding to *number*

CLEAN(text)
Removes control characters from *text*

CODE(text)
ASCII code of the first character in *text*

DOLLAR(number,*decimals*)
Rounds *number* and gives as text in currency format

EXACT(text1,text2)
Tests to see if *text1* and *text2* are exactly the same

FIND(find_text,within_text,*start_at_num*)
Finds *find_text* within *within_text*

FIXED(number,*decimals*)
Rounds *number* and gives as text

LEFT(text,*number_of_characters*)
Extracts first *number_of_characters* from *text*

LEN(text)
Length of *text*

LOWER(text)
Converts *text* to lowercase

MID(text,start_number,number_of_characters)
Extracts *number_of_characters* from *text*

PROPER(text)
Converts *text* to initial capitals

REPLACE(old_text,start_num,num_chars,new_text)
Replaces *num_chars* characters in *old_text* with *new_text*

REPT(text,number_times)
Repeats *text number_times* times

RIGHT(text,*number_of_chars*)
Last *number_of_chars* characters in *text*

SEARCH(find_text,within_text,*start_at_num*)
Searches for *find_text* within *within_text*

SUBSTITUTE(text,old_text,new_text,*instance_number*)
Substitutes *new_text* for *old_text* in *text*

TEXT(value,format_text)
Converts *value* to text using format *format_text*

TRIM(text)
Removes spaces from *text*

UPPER(text)
Converts *text* to uppercase

VALUE(text)
Converts *text* to a number

Trigonometric Functions

ACOS(number)
Arccosine of *number*

ASIN(number)
Arcsine of *number*

ATAN(number)
Arctangent of *number*

ATAN2(x_number,y_number)
Arctangent of point (*x_number,y_number*)

COS(radians)
Cosine of *radians*

SIN(radians)
Sine of *radians*

TAN(radians)
Tangent of *radians*

Related Information

Reference

For information on	See
Creating user-defined functions	Macro
Formulas and using the formula bar	Formula Formula bar
Calculation	Calculation

Functions and Macros

Complete information about worksheet functions and macros

Sampler

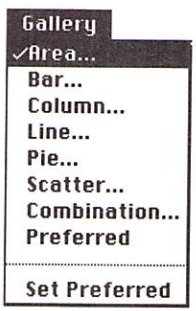
Calculating a Sales Commission

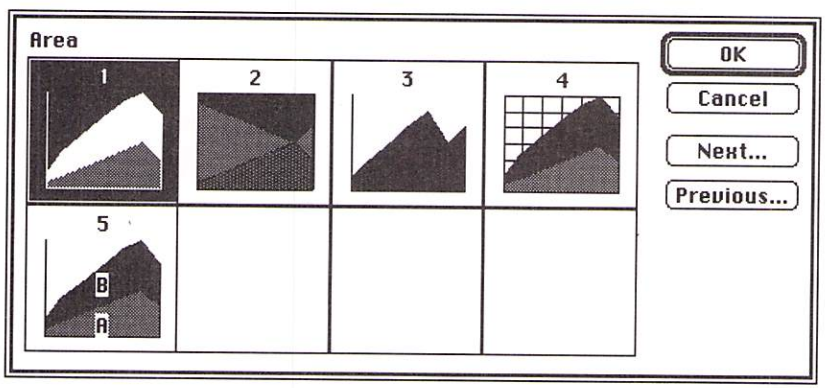
Gallery Area command

Changes the format of the active chart to the area format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the area format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart.**





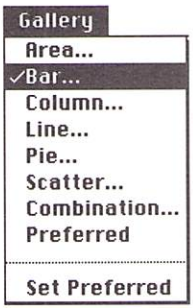
You can select from the following area chart formats:

- Simple area chart
- 100% area chart
- With drop lines
- With gridlines
- With areas labeled

Next Displays the gallery for the next chart type on the Gallery menu.

Previous Displays the gallery for the previous chart type on the Gallery menu.

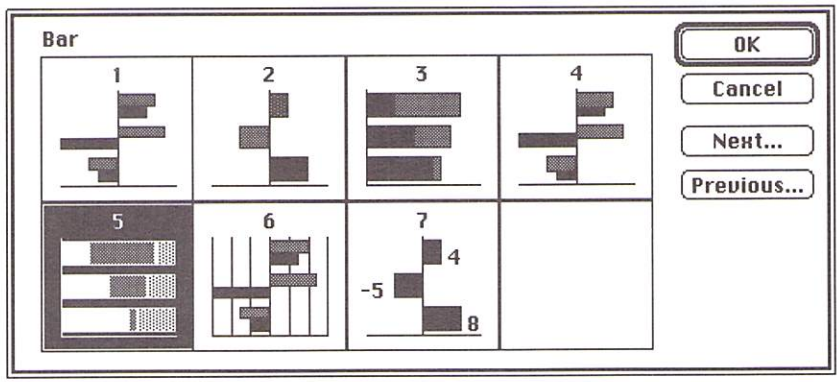
Gallery Bar command



Changes the format of the active chart to the bar format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the bar format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart.**



You can select from the following bar chart formats:

- Simple bar chart
- Bar chart for one series with varied patterns
- Stacked
- Overlapped
- 100% stacked
- With vertical gridlines
- With value labels

Next Displays the gallery for the next chart type on the Gallery menu.

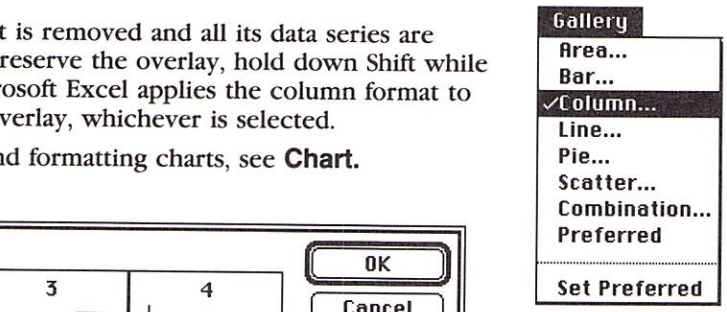
Previous Displays the gallery for the previous chart type on the Gallery menu.

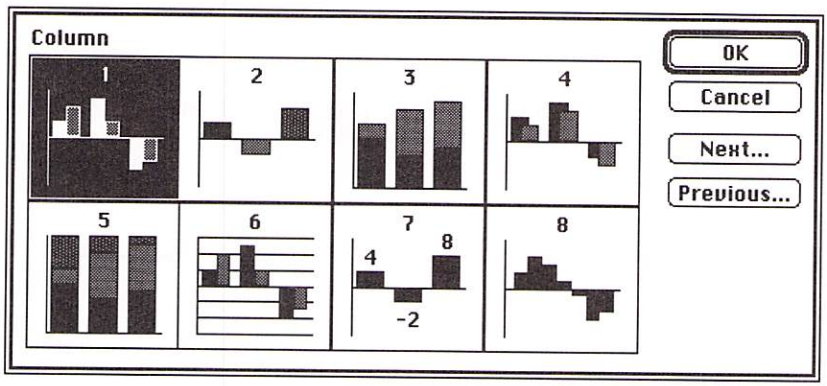
Gallery Column command

Changes the format of the active chart to the column format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the column format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart.**





You can select from the following column chart formats:

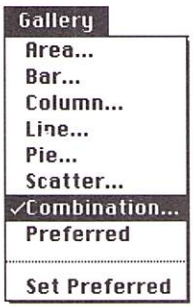
- Simple column chart
- Column chart for one series with varied patterns
- Stacked
- Overlapped
- 100% stacked
- With horizontal gridlines
- With value labels
- Step chart (no space between categories)

Next Displays the gallery for the next chart type on the Gallery menu.

Previous Displays the gallery for the previous chart type on the Gallery menu.

Gallery Combination command

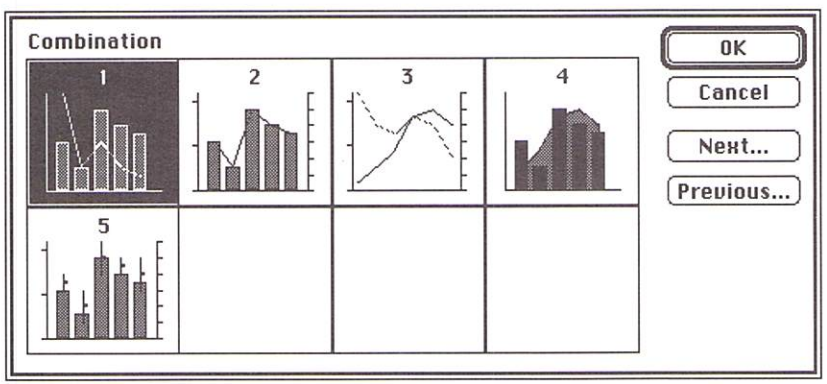
(Full Menus)



Changes the format of the active chart to the combination format you select from the gallery.

Microsoft Excel divides the data series equally between the main chart and the overlay chart. If there is an odd number of data series, the main chart takes one more than the overlay chart. The only exception is combination chart type 5, which must always contain four series. The first series is used for the main chart, and the other three series are used for the overlay chart.

For information on creating and formatting charts, and controlling how a chart distributes data series between the main chart and the overlay chart, see **Chart.** For information on changing distribution of series, see **Format Overlay command** and **Overlay chart.**



You can select from the following combination chart formats:

- Column chart overlaid by line chart
- Column chart overlaid by line chart with independent scale
- Line chart overlaid by line chart with independent scale
- Area chart overlaid by column chart
- Bar chart overlaid by line chart containing three data series (for showing stock volumes related to high, low, and closing prices)

Next Displays the gallery for the next chart type on the Gallery menu.

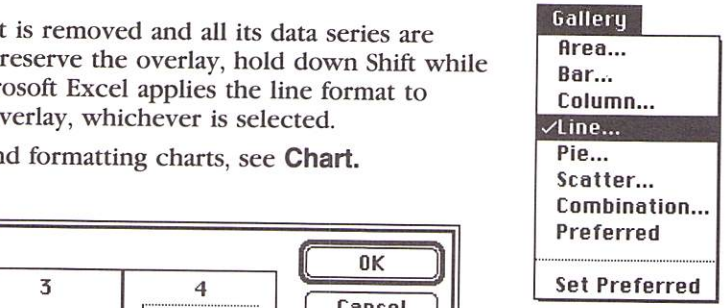
Previous Displays the gallery for the previous chart type on the Gallery menu.

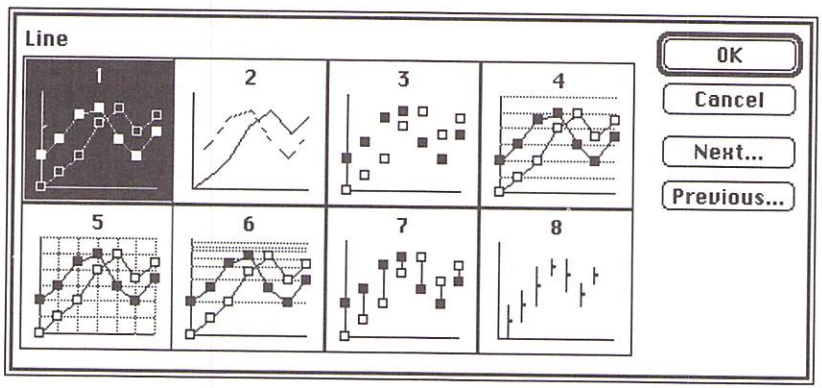
Gallery Line command

Changes the format of the active chart to the line format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the line format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart.**





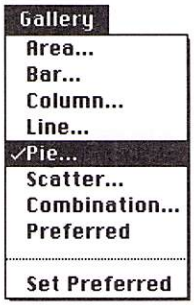
You can select from the following line chart formats:

- Lines and markers
- Lines only
- Markers only
- Lines and markers with horizontal gridlines
- Lines and markers with horizontal and vertical gridlines
- Lines and markers with logarithmic scale and gridlines
- Hi-lo chart with markers and hi-lo lines
- High, low, close chart (for stock quotes)

Next Displays the gallery for the next chart type on the Gallery menu.

Previous Displays the gallery for the previous chart type on the Gallery menu.

Gallery Pie command

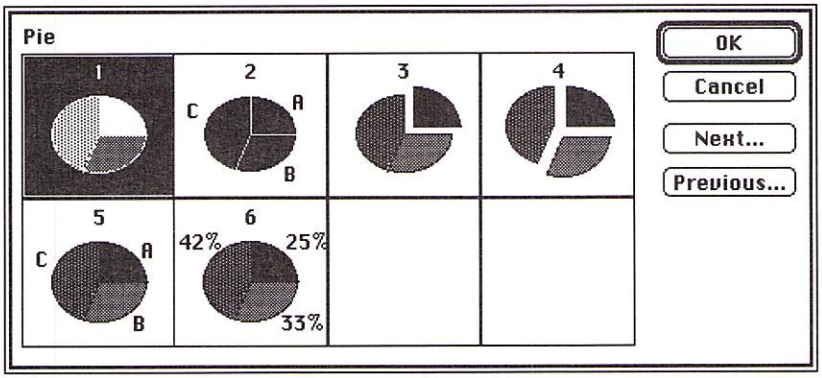


Changes the format of the active chart to the pie format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the pie format to either the main chart or the overlay, whichever is selected.

If you have more than one data series, a pie chart plots only the first one.

For information on creating and formatting charts, see **Chart.**



You can select from the following pie chart formats:

- Simple pie chart
- All wedges patterned the same and labeled with categories
- First wedge exploded
- All wedges exploded
- With category labels
- With value labels expressed as percentages

Next Displays the gallery for the next chart type on the Gallery menu.

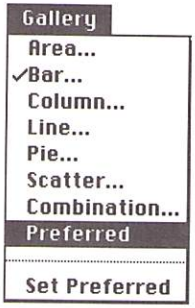
Previous Displays the gallery for the previous chart type on the Gallery menu.

Gallery Preferred command

(Full Menus)

Changes the format of the active chart to the format you define with the Gallery Set Preferred command. Initially, the preferred chart format is format 1 from the Gallery Column dialog box.

For information on the preferred format, see **Gallery Set Preferred command.** For information on charts, see **Chart.**



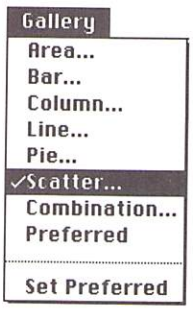
Gallery Scatter command

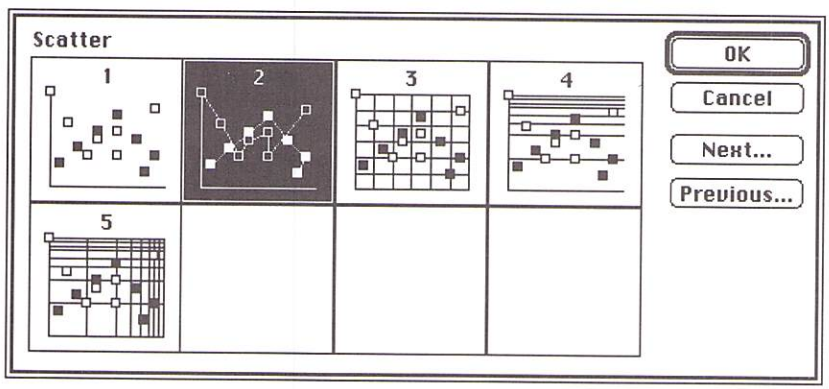
Changes the format of the active chart to the scatter format you select from the gallery.

If you have an overlay chart, it is removed and all its data series are added to the main chart. To preserve the overlay, hold down Shift while you click the OK button; Microsoft Excel applies the scatter format to either the main chart or the overlay, whichever is selected.

In a scatter chart, categories must be numbers. Microsoft Excel calculates the scale and tickmark labels for the category axis, just as it does for the value axis in all charts.

For information on creating and formatting charts, see **Chart.**





You can select from the following scatter chart formats:

- Markers only
- Markers from the same series connected by lines
- Markers with horizontal and vertical gridlines
- Markers with semi-logarithmic gridlines
- Markers with log-log gridlines

Next Displays the gallery for the next chart type on the Gallery menu.

Previous Displays the gallery for the previous chart type on the Gallery menu.

Gallery Set Preferred command

(Full Menus)

Changes the default format that Microsoft Excel uses when you create a new chart or when you format a chart with the Gallery Preferred command.

Initially, the preferred chart format is format 1 from the Gallery Column dialog box.

To change the preferred format, change the format of your active chart to the format you want and choose Gallery Set Preferred.

When you choose Gallery Set Preferred, the format of the active chart becomes the preferred format, and Microsoft Excel uses that format when you create a new chart or change the format of an existing chart with the Gallery Preferred command.

You can save the settings of the preferred format by saving the workspace with the File Save Workspace command (full menus). When you restart Microsoft Excel and open the workspace file, Microsoft Excel sets the preferred format to what it was when the workspace file was saved. For more information, see **File Save Workspace command.**

For information on creating and formatting charts, see **Chart.** For more information on giving a chart the preferred format, see **Gallery Preferred command.**

Hardware and system configuration

This topic explains:

- System requirements
- Optional system components
  Printing devices
  Mouse
  Math coprocessor
  Networks

System Requirements

To run Microsoft Excel, your computer system must include any of the following components:

Personal computer	Macintosh Plus Macintosh SE Macintosh II Macintosh IIx Macintosh SE/30 Macintosh XXX
Disk Drives	Two double-sided floppy drives A hard disk An Appleshare network
Memory	1 megabyte
Operating system	An Apple System folder and associated files necessary to start and run your Macintosh. The following is the minimum recommended system configuration for your Macintosh:

Macintosh model	System	Finder version
Macintosh Plus	3.2	5.3
Macintosh SE	4.0	5.4
Macintosh II	4.1	5.5

Note If you do not have the minimum system configuration for your Macintosh, see your Apple dealer.

Optional System Components

Microsoft Excel supports several optional system components. The following is a guide to the supported components, listing their benefits and explaining how to install them.

MultiFinder

Microsoft Excel is fully compatible with Apple's MultiFinder operating system software. When your Macintosh is using MultiFinder and also has sufficient memory to run multiple applications, Microsoft Excel can be operated in the background. Microsoft Excel can perform calculations, execute macros, save, close, and open documents while you are working in another application. For example, while Microsoft Excel is running a macro or doing a long calculation, you can type a memo in Microsoft Word. Other applications that run under MultiFinder can perform a complex operation in the background while you use Microsoft Excel for other work.

If a macro displays a dialog box while you're working in another application, Microsoft Excel stops processing. A "Waiting..." message appears to the left of the formula bar and the Macintosh beeps once. To continue processing, activate Microsoft Excel and close the dialog box by clicking the OK or Cancel button. Activating dialog boxes and menus in other applications temporarily stops any background processing in Microsoft Excel.

Extra Memory

If your Macintosh has more than 1 megabyte of RAM, you can take advantage of that extra memory by knowing how Microsoft Excel uses memory. The first 4 megabytes of RAM allocated to Microsoft Excel are used in specific ways.

The first 2 megabytes of RAM (0–2048K) in a system with at least 4 megabytes of RAM are used to store all formulas (entries beginning with "="). The second 2 megabytes of RAM (2048–4096K) are used to store constant values and strings. You cannot have more than 2 megabytes of formulas and/or 2 megabytes of constant values and strings in a workspace.

For more information about memory, see **Memory management.**

Printing Devices

Microsoft Excel supports printing devices that can be used with the Apple Macintosh computer. See your dealer or printer documentation for more information.

Math Coprocessor

Microsoft Excel takes advantage of the Motorola 68881 and 68882 math coprocessors.

A math coprocessor makes Microsoft Excel run faster when performing calculations involving multiplication, division, exponentiation, or trigonometric functions.

Networks

Using Microsoft Excel on a computer attached to a network enables you to:

- Access Microsoft Excel documents stored in network directories. Documents can be shared by more than one user, so that you can easily exchange them with other users on the same network.
- Print Microsoft Excel documents on printers or plotters attached to the network.
- Run Microsoft Excel from program files stored on a network drive. This saves space on your hard disk since you do not need to keep a set of program files on it. For information on restrictions on network use, see your Microsoft Excel license agreement.

Note The performance of Microsoft Excel or other application programs running from program files stored on a network drive will typically be slower than when running from program files stored on your hard disk.

To attach your computer to a network, follow the instructions of the network manufacturer or consult your dealer. For information on accessing Microsoft Excel documents stored on a network directory or running Microsoft Excel from a network drive, see **Networks with Microsoft Excel.**

Related Information

Reference

For information on	See
Efficient memory use	Memory management
Copying or moving data between Microsoft Excel and other applications	Exchanging data between applications
Linking Microsoft Excel worksheets to other applications	Linking documents

Headers and footers

A **header** (also called a running head) is a line of text printed at the top of each page of a document. A **footer** is a line of text printed at the bottom of each page of a document. You can create headers and footers to identify documents or parts of documents and to "time-stamp" your work with dates and times.

This topic explains:

- Defaults for headers and footers
- Setting up headers and footers

Defaults for Headers and Footers

Unless you specify otherwise, Microsoft Excel automatically prints headers and footers for any document, using the following default settings:

- **Content** — document name as header; the word "Page" and the page number as footer
- **Alignment** — centered
- **Position** — one-half inch from top or bottom of page
- **Font** — current standard font (set with Options Standard Font command)

You can modify the content, style, and alignment of headers and footers. For example, if your worksheet or chart is part of a larger report, you might revise the header to reflect the name and pagination of the overall report. Or, you might include your company's name in a header if the document is for presentation. You can also enter dates and times in a header or footer as a way of "time-stamping" a document.

Each worksheet, macro sheet, and chart document has its own header and footer. When you print the Info window, the header and footer are for the referenced document.

Setting Up Headers and Footers

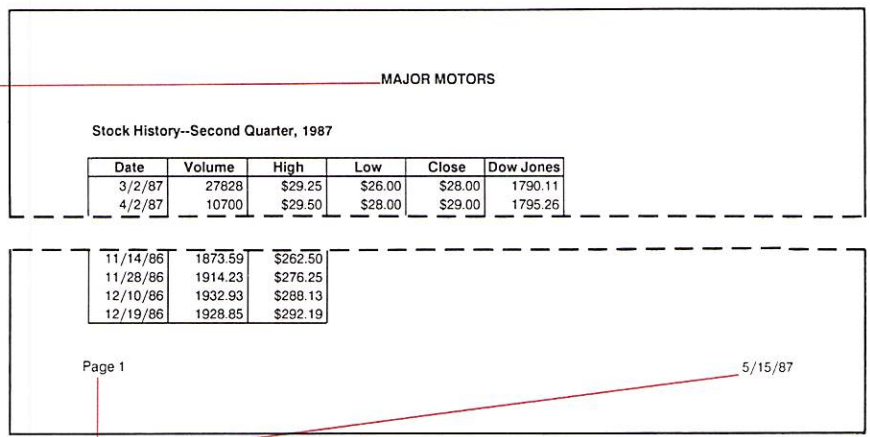
The File Page Setup command controls the content, alignment, font, and style (bold or italics) of headers and footers. In the dialog box, you specify headers and footers by using special codes in the Header or Footer text boxes. You can use any or all of the following instructions in setting up a header or footer:

Type	To
&L	Align the characters that follow at the left margin.
&C	Center the characters that follow.
&R	Align the characters that follow at the right margin.
&B	Print the left, center, or right part of the header or footer in bold.
&I	Print the left, center, or right part of the header or footer in italics.
&U	Print the left, center, or right part of the header or footer in underline style.
&S	Print the left, center, or right part of the header or footer in strikeout style.
&O	Print the left, center, or right part of the header or footer in outline style.
&H	Print the left, center, or right part of the header or footer in shadow style.
&D	Print the current date.
&T	Print the current time.
&F	Print the name of the document.
&&	Print a single ampersand.

Type	To
&*"font name"*	Print the left, center, or right part of the header or footer in the font you type in for *"font name."* Make sure to enclose the font name in double quotation marks.
&*points*	Print the left, center, or right part of the header or footer in the point size specified by *points.*
&P	Print the page number.
&P + *number*	Add *number* to the page number and print it. (Use to change starting page numbers.)
&P − *number*	Subtract *number* from the page number and print it.

The following example indicates the formatting instructions entered in the File Page Setup dialog box to produce a worksheet with headers and footers as shown:

This header is printed from these instructions in the Header box: &C&BMAJOR MOTORS



This footer—with page number and date aligned as shown—is printed from these instructions in the Footer box: &LPage &P&R&D

For information on printing and page setup, see **Printing a document** and **File Page Setup command.** For information on using fonts, see **Font.**

To set up headers and footers for a document:

1. Choose File Page Setup.
2. Edit or delete the existing instructions in the Header and Footer boxes.
3. Click the OK button.

Related Information

Reference

For information on	See
Printing worksheets and charts	Printing a document
General overview of formatting options (including print and display options)	Formatting a document

Help

Microsoft Excel **Help** is a complete online reference tool that provides information on Microsoft Excel commands, worksheet functions, concepts, basic tasks, and messages. You can get help on a selected command, an open dialog box, or a message, or you can browse through Help as a general reference. Within a Help topic, you can "jump" to a related topic or get a quick definition of a term. The Lotus 1-2-3 button gives you fast information on Microsoft Excel equivalents for Lotus 1-2-3 commands.

This topic explains:

- Help basics
- Displaying Help

  Getting help on Help

  Getting help on commands, dialog boxes, and messages (context-sensitive help)

  Using Help as a general reference

  Getting help on Lotus 1-2-3

Help Basics

Microsoft Excel Help appears in its own window. You can move and size the Help window just as you would any document window.

Help topics are displayed in a list box within the Help window. You can scroll this list box as you would any document window.

Within the Help window, you'll find some special features:

- **Defined term** — a word or phrase with a dotted underline. When you point to a defined term and hold down the mouse button, Help displays a brief definition of the term in a small box that overlaps the Help window. The "Defined Terms" topic contains every defined term used in Microsoft Excel Help.
- **Jump term** — a word or phrase with a solid underline. When you select a jump term, Help "jumps to" and displays the Help topic for that term. This is one of the methods you use to move around within Help. Some topics, such as the Help topic list you first see when you choose the Window Help command, consist entirely of jump terms.

For instructions on moving within Help, choose the Window Help command and click the topic Using Help.

Displaying Help

You can get help with Microsoft Excel in several ways. This section provides instructions on the various ways to access Help.

Getting Help on Help

Use this procedure to view the Help topic that explains how to use Microsoft Excel Help:

1. Choose the Window Help command.
2. Click Using Help at the top of the topic list.

Getting Help on Commands, Dialog Boxes, and Messages (Context-sensitive Help)

Each Microsoft Excel command name on a menu, dialog box, and message is a "context" that is directly connected to a Help topic. When you ask for help on one of these contexts, you're using "context-sensitive" Help. Regions of the screen, such as the status bar, are also considered contexts for which you can ask for help directly.

With Microsoft Excel Help you can get help either on the current context — an open dialog box or displayed message — or you can specify the context for which you want help — a menu command or a region of the screen.

To get help on the current context

- Press Command+/ or Help (Help key on extended keyboard).

  This opens the Help window and displays the related Help topic.

To specify a context for Help

1. Press Command+Shift+/ (Command+?) or Shift+Help (Help key on extended keyboard).

   The mouse pointer changes to a question mark.
2. Choose a command with the question mark pointer or click a region of the screen.

   This opens the Help window and displays the related Help topic. If you choose a command, you get help on that command instead of executing it.

To return to your document from Help:

- Click the close box or the Cancel button in the Help window.

Using Help as a General Reference

Much of the information contained in Help, such as worksheet function topics and the list of defined terms, is not associated with a specific context. The easiest way to find this general information, or to browse through the Help information, is to start with the Help topic list.

To browse through Help using the mouse:

1. Choose the Window Help command.
   Microsoft Excel opens Help and displays the Help topic list. The Help topic list provides a table of contents for Help that you can use to jump to new topics.
2. Click the topic you want information on.
   The Help topic appears.
3. If the topic contains only terms with solid underlines (jump terms), click the jump term you want more information on.
   If the topic contains only terms with dotted underlines (defined terms), point to the term you want information on and hold down the mouse button. The term definition is displayed as long as you hold down the mouse button.
4. Continue to move around in Help using the jump terms. Or, choose the Next or Previous button to view the next or previous topic on the topic list, or choose the Back button to view the last topic you viewed before the current topic.
5. To return to the Help topic list, choose the Topics button.

To browse through Help using the keyboard:

1. Press Command+/ or Help (Help key on extended keyboard) when no dialog box or message is displayed.
   The Help topic list is displayed.
2. Press Tab until you select the topic you want; then press Enter.

   Tip To scroll quickly to a topic, type the first letter of the topic. The Help window scrolls to the first topic starting with that letter. To scroll to the next topic beginning with that letter, press the letter again.

3. If the topic contains only terms with solid underlines (jump terms), press Tab until you select the jump term you want, and then press Enter.
   If the topic contains only terms with dotted underlines (defined terms), press Tab until you select the term you want information on, and then hold down Enter. The term definition is displayed as long as you hold down Enter.

4 Continue to move around in Help using the jump terms. Or, choose the Next or Previous button to view the previous or next topic on the topic list, or choose the Back button to view the last topic you viewed before the current topic.

5 To return to the Help topic list, choose the Topics button.

Note You can also use the Direction keys instead of Tab to select jump terms and definition terms in Help.

For detailed information on how to move around within Help, click the Using Help topic on the Help topic list.

To return to your document from Help:

■ Click the close box or the Cancel button in the Help window.

Getting Help on Lotus 1-2-3

If you're familiar with Lotus 1-2-3, you can quickly find the Microsoft Excel equivalents to 1-2-3 commands. With the Help Lotus 123 feature, you can type a command sequence as you would in 1-2-3, and Help displays the Help topic for the Microsoft Excel equivalent (or closest equivalent) to that command.

1 Choose the Window Help command. Or, press Command+/ or Help (Help key on extended keyboard) when no dialog box or message is displayed.

2 Click the Lotus 123 button.

3 In the dialog box, type a Lotus 1-2-3 command sequence. You can type uppercase or lowercase characters.

Microsoft Excel displays the Help topic for the Microsoft Excel equivalent to the Lotus 1-2-3 command. If there is no exact equivalent, you see a topic explaining which Microsoft Excel command or commands accomplish the most similar task.

For information on conversion between Lotus 1-2-3 and Microsoft Excel, see **Lotus 1-2-3.**

Related Information

Reference

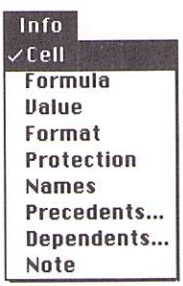
For information on	See
Worksheet, chart, and database basics	Worksheet Chart Database
Choosing commands and working in dialog boxes	Command, menu, and dialog box
Working with windows	Windows

Functions and Macros

"Using Custom Help" in Chapter 7, "Custom Menus and Dialog Boxes"

Info Cell command

(Full Menus)



Controls whether the Info window displays the reference of the active cell.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Cell command is in effect, the Info window displays the reference of the active cell of the worksheet.

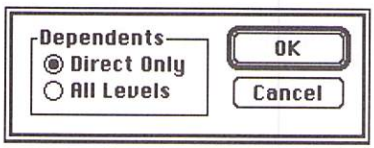
Choosing Info Cell puts the command in effect; the cell reference appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Cell again reverses the command.

Info Dependents command

(Full Menus)

Controls whether the Info window lists the cells with formulas that refer to the active cell. **Dependents** are cells with formulas that depend on the active cell for their calculations.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**



Dependents

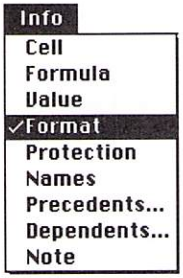
Direct Only	Lists only the cells containing a formula that refers directly to the active cell
All Levels	Lists the cells that are direct dependents of the active cell, the direct dependents of those cells, and so on

For example, you might have a worksheet where the formula in cell A1 refers to cell B2, and cell B2 refers to cell C3. If C3 is the active cell, its direct dependent is B2, because B2 depends on C3 for data.

All levels of dependents for C3 include both B2 and A1. A1 is included because it is a dependent for B2, which is in turn a dependent for C3.

Info Format command

(Full Menus)



Controls whether the Info window displays the formats that have been applied to the active cell.

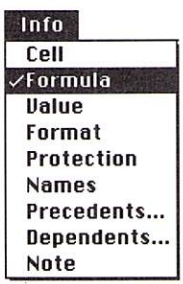
The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Format command is in effect, the Info window displays the number, alignment, font, border, and shading formats of the active cell in that worksheet. For information on changing these formats, see **Format Number command, Format Alignment command, Format Font command,** and **Format Border command.**

Choosing Info Format puts the command in effect; the cell formats appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Format again reverses the command.

Info Formula command

(Full Menus)



Controls whether the Info window displays the active cell's contents as displayed in the formula bar of the worksheet.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

Choosing Info Formula puts the command in effect; the contents of the active cell in the worksheet appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Formula again reverses the command.

Info Names command

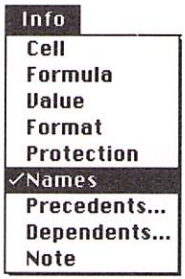
(Full Menus)

Controls whether the Info window displays names of any named areas that include the active cell.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Names command is in effect, the Info window displays all of the names in that worksheet referring to a cell range that includes the active cell. For information on names, see **Names.**

Choosing Info Names puts the command in effect; the names appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Names again reverses the command.



Info Note command

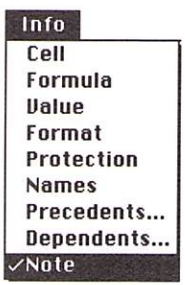
(Full Menus)

Controls whether the Info window displays the note, if there is one, that is attached to the active cell.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Note command is in effect, and if the active cell in that worksheet has a note attached to it, the Info window displays the note. For information on adding or editing a note, see **Formula Note command.**

Choosing Info Note puts the command in effect; the cell note appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Note again reverses the command.

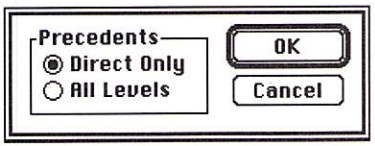


Info Precedents command

(Full Menus)

Controls whether the Info window lists the cells to which the formula in the active cell refers. **Precedents** are cells that are calculated before the active cell, and on which the formula in the active cell depends for its calculations.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**



Precedents

Direct Only	Lists only the cells that the formula in the active cell refers to directly
All Levels	Lists the cells that are direct precedents of the active cell, the direct precedents of those cells, and so on

For example, you might have a worksheet where the formula in cell A1 refers to cell B2, and cell B2 refers to cell C3. If A1 is the active cell, its direct precedent is B2. B2 precedes A1 in the order of calculation because the formula in A1 makes its calculation based on the data in B2.

All levels of precedents for A1 include both B2 and C3. C3 is included because it is a precedent for B2, which is in turn a precedent for A1.

Info Protection command

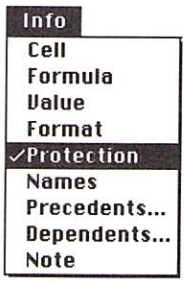
(Full Menus)

Controls whether the Info window displays the cell protection status of the active cell.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Protection command is in effect, the Info window displays the status of protection for the active cell in that worksheet. An individual cell can be locked or its formula hidden. For information on cell protection, see **Format Cell Protection command** and **Protecting or hiding data.**

Choosing Info Protection puts the command in effect; the cell protection status appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Protection again reverses the command.



Info Value command

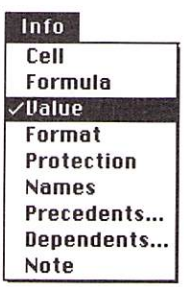
(Full Menus)

Controls whether the Info window displays the value produced by the contents of the active cell.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command.**

If the Info Value command is in effect, the Info window displays the value produced by the contents of the active cell in that worksheet.

Choosing Info Value puts the command in effect; the cell value appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Value again reverses the command.



Info window

The **Info window** displays detailed information about the active cell, such as notes or formats attached to the cell, the underlying formula of the cell, names or named ranges associated with it, and the cell's protection status.

You can open the Info window whenever you want to look up details about a specific cell, or you can keep the Info window displayed while you work so you can monitor the underlying contents of your worksheets and macro sheets. You can also generate Info window printouts that contain all the data listed in the Info window.

This topic explains:

- Info window basics

  Opening and closing the Info window
  Specifying the information displayed
  Working with the Info window displayed
  Keeping the Info window open in the workspace

- Using the Info window

  Getting information about a specific cell
  Scrolling through cell notes in the Info window
  Finding data quickly with the Info window
  Printing Info window information

This topic does not discuss basic information about the Microsoft Excel cell note feature, which you can use to document your worksheet models and macro sheets. For information on using cell notes, see **Notes.**

Note All Info window procedures for worksheets also apply to macro sheets.

Info Window Basics

The Info window acts as a "magnifying glass" so you can see detailed information about the active cell. Because the Info window lets you probe for details quickly, it's especially useful for the following tasks:

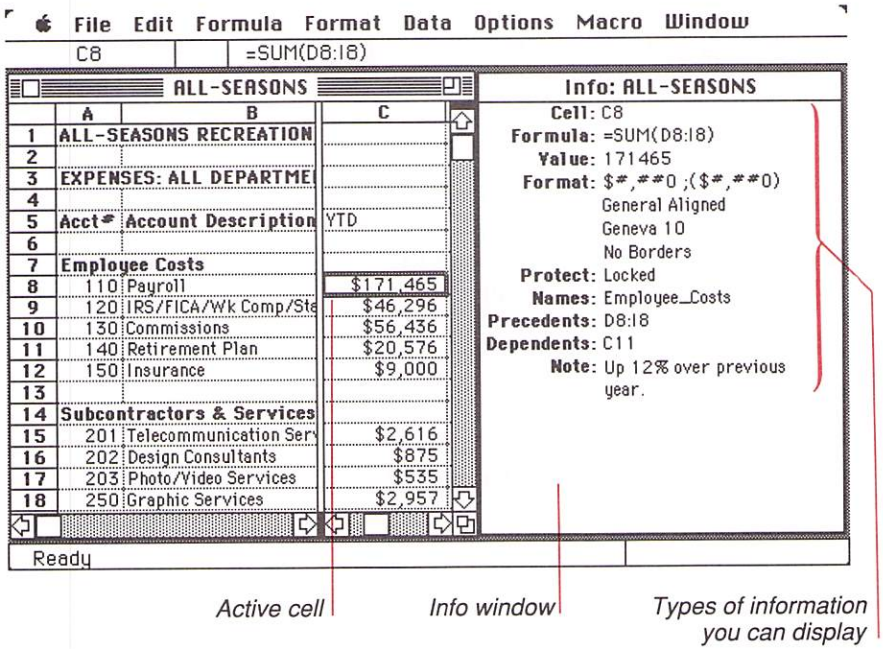
- **Auditing and debugging a model.** For example, you might want to verify the formula used in a given cell, or check for unexpected or missing precedents of the cell.
- **Taking a "guided tour" of a worksheet model or a macro.** You can use the Info window with the Formula Select Special command to quickly scan all notes attached to cells in a worksheet or macro sheet as you move around the document.
- **Locating cell information quickly.** You can use the Info window with the Formula Find command to locate specific cell information quickly. For example, if you attached a note to a cell and later wanted to find that note, you could search for a series of characters (such as a name) contained in the note with the Formula Find command.

Opening and Closing the Info Window (Full Menus)

You open the Info window with the Window Show Info command.

When you open the Info window, the menu bar changes to display the Info window menus. Initially, the Info window opens in the upper-right corner of your worksheet. You can move or adjust the Info window as you do any other window.

You can also change the types of information displayed by selecting options from the Info menu. In the following illustration, the Info window is set up to display all nine types of data available through the Info window.



To open the Info window:

- Choose Window Show Info.

The title bar of the Info window indicates the name of the worksheet for which it is displaying information.

To close the Info window:

- Click the close box in the upper-left corner of the Info window.

Specifying the Information Displayed (Full Menus)

When you first open the Info window, it displays three types of information about the active cell: the cell reference, the formula, and any notes attached to the cell. You can modify the types of information displayed by choosing commands from the Info menu. For example, if you choose the Info Format command, the Info window displays the formats of the active cell, including number format, alignment, font, borders, and shading.

You can display any or all of the following types of information in the Info window:

- **Cell** — the reference of the active cell.
- **Formula** — the contents of the active cell as displayed in the formula bar.
- **Value** — the value produced by the contents of the active cell.
- **Format** — the format settings of the active cell (number format, alignment, font, borders, and shading).
- **Protection** — the protection settings for the active cell (whether the cell is locked or the formula is hidden).
- **Names** — the list of the named cell ranges that include the active cell.
- **Precedents** — the list of the cells that the active cell refers to. For example, if the active cell's formula is =A2+A3, the precedents would be A2 and A3.
- **Dependents** — the list of the cells that refer to the active cell. For example, if A1 is the active cell and the formula for A2 is =A1+A4, then A2 would be displayed as a dependent of A1.
- **Note** — the text of the note, if any, attached to the active cell.

To specify the type of information you want displayed in the Info window:

1. With the Info window active, select the Info menu.
2. Choose the command for the type of information you want to display. Microsoft Excel places a checkmark next to the command.
3. Repeat step 2 for each type of data you want displayed.

To turn off an information type in the Info window:

1. With the Info window active, select the Info menu.
2. Choose the command for the information type you want to turn off. Microsoft Excel removes the checkmark next to the command.
3. Repeat step 2 for each information type you want to turn off.

Direct and Indirect Precedents and Dependents

When you choose the Info Precedents or Info Dependents command, Microsoft Excel displays a dialog box so you can specify whether you want to display all precedents and/or dependents of the active cell or only direct precedents and/or dependents. Use the following definitions as guidelines when determining the type of precedents or dependents you want displayed in the Info window:

A **direct precedent** of the active cell is a cell that is directly referred to in the formula of the active cell. For example, if the formula for the active cell is =A2+A3, then A2 and A3 are the direct precedents of the active cell.

An **indirect precedent** of the active cell is a cell that is indirectly referred to in the formula of the active cell. For example, if the formula for the active cell is =A2, and the formula for A2 is =A3, then A3 is an indirect precedent of the active cell (and a direct precedent of A2).

A **direct dependent** of the active cell is a cell whose formula directly refers to the active cell. For example, if A1 is the active cell and the formula for A2 is =A1+4, then A2 is a direct dependent of A1.

An **indirect dependent** of the active cell is a cell whose formula indirectly refers to the active cell. For example, if A1 is the active cell and the formula for A2 is =A1, and the formula for A3 is =A2, then A3 is an indirect dependent of A1 (and a direct dependent of A2).

Working with the Info Window Displayed (Full Menus)

Using the standard procedures for moving and sizing windows, you can arrange the Info window and any open document windows so that all windows are visible in the workspace. You can also automatically "tile" the Info window and any open document windows so that all open windows are visible in the workspace. With automatic tiling, Microsoft Excel arranges the windows so that the borders interlock in the workspace with no blank space between them.

To tile the Info window and all other open windows:

1. If necessary, choose Window Show Info to open the Info window.
2. Choose Window Arrange All.

Use standard keyboard and mouse procedures for moving among the windows. For information on window techniques and procedures, see **Windows.**

Keeping the Info Window Open in the Workspace (Full Menus)

You can keep the Info window open but not necessarily displayed in the workspace. Use the following procedures to switch between the active document window and the Info window if the open windows are overlapped in the workspace.

To switch to the document window from the Info window	To switch to the Info window from the active document window
▣ Choose Window Show Document.	▣ Choose Window Show Info.

Using the Info Window

This section discusses basic procedures for using the Info window when building, editing, or auditing worksheets. For information on additional worksheet auditing procedures, see **Auditing worksheet models.**

Getting Information About a Specific Cell (Full Menus)

1. Select the cell you want to examine.
2. Choose Window Show Info.
3. If necessary, change the information displayed by selecting the appropriate Info menu commands (see "Specifying the Information Displayed," earlier in this topic).

Scrolling Through Cell Notes in the Info Window (Full Menus)

Microsoft Excel includes a cell notes feature for documenting worksheets and macro sheets. With the Info window displayed, you can quickly scan all cell notes in a worksheet or macro sheet, using the Formula Select Special command.

To scroll through cell notes:

1. If necessary, choose Window Show Info to open the Info window. Make sure you have chosen Info Note to display notes in the Info window.
2. Move and size the windows so both the worksheet window and Info window are visible.

   If you want to see all open windows, choose Window Arrange All.
3. Activate the worksheet window.
4. Choose Formula Select Special.
5. In the dialog box, select Notes.
6. Click the OK button.

   Microsoft Excel makes a multiple selection that includes all cells with notes attached to them.
7. Press Tab to move cell-by-cell through the selected cells and display the note for each in the Info window.

Tip If other users will be working with your model, you can attach notes to cells explaining the worksheet model. Or, you can attach notes to key cells in a macro sheet, giving instructions for running the macro. Then you can set up a guided tour of the worksheet or macro sheet that includes viewing the cell notes with the procedure explained in this section. For information on cell notes, see **Notes.**

Finding Data Quickly with the Info Window
(Full Menus)

Use this procedure to locate a specific series of characters contained in a cell note or in a formula.

1. If necessary, choose Window Show Info to open the Info window.
2. Move and size the windows so that both the worksheet window and Info window are visible.

   If you want to see all open windows, choose Window Arrange All.
3. Activate the worksheet window.
4. Choose Formula Find.
5. In the Find What text box, type the characters you want to find.
6. Depending on where you want Microsoft Excel to look for the specified characters, select Formulas or Notes in the Look In box.
7. Click the OK button.

For information on finding data fast, see **Finding cells and data quickly.**

Printing Info Window Information
(Full Menus)

You can print the information displayed in the Info window. Microsoft Excel prints the Info window information for all cells currently selected in the worksheet window.

To print information only for selected cells

1. Make sure the Info window is open.
2. Activate the worksheet window.
3. Select the cells for which you want to print information.
4. Activate the Info window.
5. Choose File Print.
6. Change any options you want.
7. Click the OK button.

To print information for all cells in the worksheet

1. Select the entire worksheet.
2. Choose Window Show Info.
3. Choose File Print.
4. Change any options you want.
5. Click the OK button.

Note You can also use other worksheet printing options for Info window print-outs. For example, you can preview the document before printing or specify a different printer. For more information, see **Printing a document.**

Related Information

Reference

For information on	See
Tracing relationships among cells, verifying range names	Auditing worksheet models
Absolute, relative, and mixed references	References
Resolving circular references	Circular reference
Trouble-shooting error values	Error value

Sampler

Correcting for Instrument Drift

Inserting blank cells

You may want to insert one or more blank cells, rows, or columns to accommodate additional data or to add white space on the worksheet.

When you insert blank cells, Microsoft Excel shifts the other cells in your worksheet to accommodate the new cells, and updates references to the shifted cells to reflect their new locations.

Inserting Cells

1. Select the area where you want blank cells inserted.

   The area you select should be the same size as the area of blank cells you want to insert.
2. Choose Edit Insert.

   If you insert entire rows or columns, Microsoft Excel automatically shifts the other cells in the worksheet. If you insert a single cell or a cell range, Microsoft Excel displays a dialog box so you can decide how to shift the selected cells.
3. Click Shift Cells Right or Shift Cells Down.
4. Click the OK button.

Note When Microsoft Excel shifts cells to accommodate an insertion, other areas of your worksheet may be disrupted. For example, suppose you are inserting cells in column B, and further down the worksheet you have a list of clients in column A and their phone numbers in column B. If you shift cells down, the phone numbers are no longer next to the appropriate clients.

When you insert cells, Microsoft Excel gives the new cells the same formats as the cells around them.

Related Information

Reference

For information on	See
Columns and rows	Column Row
Formatting text and numbers	Formatting a document
Adjusting references to moved cells	References

Insertion point

The **insertion point** is the blinking vertical line that indicates where text will be inserted when you begin typing. The insertion point appears in the active formula bar or text box in a dialog box. What you type appears at the left of the insertion point. You can move the insertion point by clicking the mouse or by pressing the Left or Right Arrow keys. For more information, see **Formula bar** and **Editing a document.**

Iteration

Iteration is the process of automatically repeating calculations until a specific numerical condition is met. Iteration is used to solve intentional circular references. Iteration enables you to create models for solving simultaneous equations and other complex tasks.

This topic explains:

- Using iteration
- Convergence and divergence

Using Iteration

Circular references involve formulas that depend on each other for their calculated results. Microsoft Excel cannot resolve such formulas using normal calculation. When you calculate a circular reference without using iteration, Microsoft Excel displays a message and the status bar indicates a cell involved in the circular reference. If the circular reference is accidental, you need to redesign the formulas or logic to break the circular reference.

Iteration can find solutions for models that depend on circular references. When Microsoft Excel iterates, it repeatedly calculates the worksheet, using the results of the previous calculation for the next calculation. With the Options Calculation command, you control iteration either by limiting the number of iteration cycles or by limiting the maximum amount of change in a value from one iteration cycle to the next.

To use iteration to calculate your worksheet:

1. Choose Options Calculation.
2. Turn on the Iteration check box.

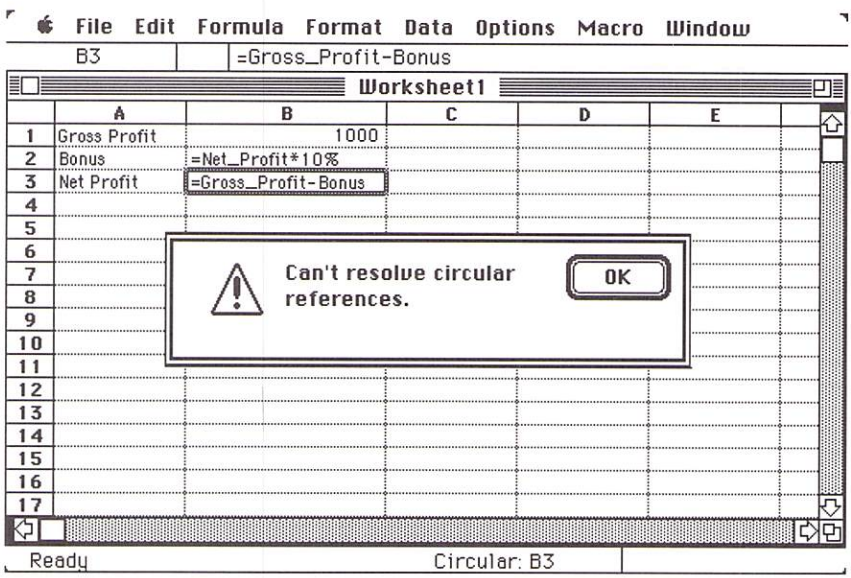
3. In the Maximum Iteration box, type the maximum number of iterations you want Microsoft Excel to perform.
4. In the Maximum Change box, type the maximum change between iterations.
5. Click the OK button.

When Microsoft Excel calculates the worksheet, it calculates circular references until either it iterates the number of times set in the Maximum Iterations box, or until all cells in the circular reference change by less than the amount in the Maximum Change box, whichever is first. By default, Microsoft Excel stops iterating after 100 iterations, or when all values on the model change by less than 0.001 between iterations. The latter condition assures results precise to at least one-tenth of one percent.

The following example shows how to use iteration to solve a worksheet model that contains circular references. The example computes a bonus that is 10 percent of net profit, where the net profit depends on the amount of the bonus.

Note The example formulas in this section use names. If you want to perform the examples in this section, be sure you have the proper names defined on your worksheet. For more information on names, see **Names.**

Gross Profit is $1,000. Net Profit is Gross Profit minus Bonus, and Bonus is 10 percent of Net Profit. The formulas for Bonus and Net Profit depend on each other — they are circular references.



After you enter the Net Profit formula, Microsoft Excel displays a message noting the circular references and produces 0 for the values of both Bonus and Net Profit.

After you turn on iteration, Microsoft Excel calculates the worksheet and produces the following results at each iteration:

After this iteration	The results are
Bonus	0.1*0=0
Net Profit	1000 − 0=1000
Bonus	0.1*1000=100
Net Profit	1000 − 100=900
Bonus	0.1*900=90
Net Profit	1000 − 90=910
Bonus	0.1*910=91
Net Profit	1000 − 91=909
Bonus	0.1*909=90.9
Net Profit	1000 − 90.9=909.1
Bonus	0.1*909.1=90.91
Net Profit	1000 − 90.91=909.09
Bonus	0.1*909.09=90.909
Net Profit	1000 − 90.909=909.091
Bonus	0.1*909.091=90.9091
Net Profit	1000 − 90.9091=909.0909

With each iteration, Bonus and Net Profit change less and approach the solution. After eight iterations Microsoft Excel stops because Bonus and Net Profit change by less than 0.001 between iterations seven and eight.

Worksheet1

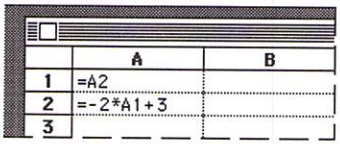
	A	B	C
1	Gross Profit	1000	
2	Bonus	90.9091	
3	Net Profit	909.0909	
4			
5			

Convergence and Divergence

In the preceding example, the values became closer to the correct solution with each iteration. This is called convergence. As the model converges, the change in values decreases between iterations.

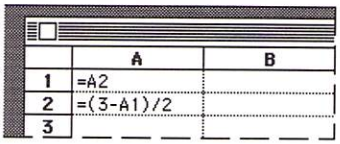
Sometimes during iteration, the difference in values between one iteration and the next increases instead of decreasing. This is called divergence. Both the starting values and the way you create the model affect whether it converges or diverges.

For example, if you want to find the solution to the simultaneous equations $x = y$ and $y = -2 \times +3$, you can set up a model in two different ways:



	A	B
1	=A2	
2	=-2*A1+3	
3		

Example 1



	A	B
1	=A2	
2	=(3-A1)/2	
3		

Example 2

The solution for both A1 and A2 is 1. However, only Example 2 converges to the solution. Example 1 diverges because of the way the formula is entered. Example 2 arrives at the values 0.9997559 and 1.0001221, which are within 0.001 of the solutions.

Note Do not build an iteration model whose convergence or divergence depends on the order of calculation. In Microsoft Excel the order of calculation is based on dependent formulas, not row or column order.

Related Information

Reference

For information on	See
Resolving circular references	Circular reference
Convergence and divergence	Convergence Divergence
Calculations in Microsoft Excel	Calculation

Keyboard

Microsoft Excel has command shortcut keys, special keys, and keyboard techniques for use with your documents. Many of the shortcut keys enable you to bypass the menus and carry out commands directly from the keyboard. Other techniques allow you to move, select, and edit large documents without taking your hands off the keyboard.

This topic explains:

- Basic keyboard information

  Keyboard conventions used in this book
  General patterns in keyboard commands
  Canceling a command or dialog box
  Getting help

- Worksheet keys

  Moving and selecting in a worksheet
  Extending or making a multiple selection (extended keyboard)
  Moving within a selection
  Scrolling a worksheet window (extended keyboard)

- Command selection keys and shortcut keys

  Choosing commands from menus
  Shortcuts for commands and dialog box options
  Function key shortcuts for commands and actions (extended keyboard)
  Miscellaneous keyboard features

This topic does not discuss keyboard procedures for working in dialog boxes, editing in the formula bar, moving and selecting in charts, or controlling windows. For information on those procedures, see **Command, menu, and dialog box, Formula bar, Chart,** and **Windows,** respectively.

Note All keyboard commands for worksheets also apply to macro sheets.

Basic Keyboard Information

Keyboard Conventions Used in This Book

Microsoft Excel Reference uses the following notational conventions regarding keys:

Plus sign (+) — A plus sign means that you press one or more keys at the same time. For example, to press Command+S, follow these steps:

1. Hold down the Command key.
2. Press S and release it.
3. Release the Command key.

Keypad and extended keyboard keys — Keypad refers to the square group of number and arithmetic keys separated from the standard keyboard keys. You can use these keys to enter numbers, by turning on Num Lock, or you can use these keys as movement keys, by turning off Num Lock. (See "Direction Keys," below). Press Shift+Clear (Num Lock) to turn Num Lock on and off.

The extended keyboard keys are the function keys (labeled F1, F2, and so on) and the movement keys located between the standard keyboard keys and the keypad. These keys enable you to perform additional operations from the keyboard.

Return and Enter keys — The Return key on the standard keyboard and the Enter key on the keypad usually perform the same action in Microsoft Excel. In all other topics, the word Enter means that you can press either the Enter key or the Return key, unless specifically stated otherwise. In this topic, both keys are listed if you can press either. If only one key is listed in this topic, you must press that key to perform the action indicated.

Direction keys — The Direction keys are the 2, 4, 6, and 8 keys on the keypad (when Num Lock is off) and the four arrow keys on the extended keyboard. The name of the individual Direction key refers to the direction the arrow points: the Down Arrow key (2 key on keypad), the Up Arrow key (8 key on keypad), the Left Arrow key (4 key on keypad), or the Right Arrow key (6 key on keypad).

General Patterns in Keyboard Commands

Understanding the logic behind keyboard commands can help you learn them more easily. Each shortcut key, editing key, and movement/selection key performs a particular action. You combine those keys with the Command, Shift, and Option keys to add different meanings to that instruction.

The following list summarizes the general patterns in keyboard commands:

- **Enter** and **Return** are used to confirm or carry out an action.
- **Tab**, the **Direction** keys, and **Home**, **End**, **Page Up**, and **Page Down** on the extended keyboard are used primarily for moving, selecting, and scrolling.
- **Command** is generally used for choosing commands and dialog box options.
- **Shift** usually does one of the following:

  Extend

  Perform the opposite action

  Go in the opposite direction

- **Option** is used in several keyboard shortcuts for applying options in the Format Number and Format Border dialog boxes. In addition, it can be used in combination with the Command key and an alphabetic key to execute a macro that you write.
- **Function keys** (F1, F2, etc., on the extended keyboard) are shortcuts for frequently used commands and actions.

Canceling a Command or Dialog Box

To cancel an operation in progress or to select the Cancel button in a dialog box:

▣ Press Command+. (period) or Escape.

Getting Help

To get online help on the open dialog box or displayed message, or to display a list of Help topics:

▣ Press Command+/ or Help (Help key on extended keyboard).

If a dialog box is open, the Help topic on that dialog box is displayed.

If a dialog box is not open, Microsoft Excel opens the Help window and displays a list of Help topics. You can jump to any Help topic on the list.

To display the Help topic for a command or screen region you choose:

1 Press Command+Shift+/ (Command+?) or Shift+Help (Help key on extended keyboard).

The mouse pointer changes to a bold question mark.

2 With the question mark pointer, choose the command or click the window feature on which you want help.

For more information on Microsoft Help, see **Help.**

Worksheet Keys

This section explains how to move around a worksheet and a selection, scroll a worksheet window, and make the following types of selections:

- **Single cell** — a selection of one cell, the active cell
- **Range** — a selection of two or more cells within one rectangular area
- **Multiple selection** — a selection consisting of any combination of single cells or ranges

Moving and Selecting in a Worksheet

Use the keys in the following table to move and select within a worksheet. Once you have selected a range, you can move within the selection and still keep the cells selected. For more information, see "Moving Within a Selection," later in this topic.

To	Press
Move one cell up, down, right, left	Direction key
Extend selection one cell up, down, left, right	Shift + Direction key
Move by one block of data left, right, up, down	Command + Direction key
Extend selection by one block of data left, right, up, down	Command + Shift + Direction key
Select entire rows containing selected cell or range	Shift + Spacebar
Extend selection of entire row to additional entire rows	Shift + Direction (Up or Down Arrow) key

Select entire columns containing selected cell or range	Command + Spacebar
Extend selection of entire column to additional entire columns	Shift + Direction (Left or Right Arrow) key
Select the entire worksheet	Command + A or Command + Shift + Spacebar
Collapse selection to single cell	Shift + Backspace
Move to start of row containing active cell	Home
Extend selection to start of row	Shift + Home
Move to start of data	Command + Home
Extend selection to start of data	Command + Shift + Home
Move to end of row containing active cell (last occupied column of sheet)	End
Extend selection to end of row (last occupied column of sheet)	Shift + End
Move to end of data	Command + End
Extend selection to end of data	Command + Shift + End
Move to start of window	Home (Scroll Lock on)
Extend selection to start of window	Shift + Home (Scroll Lock on)
Move to end of window	End (Scroll Lock on)
Extend selection to end of window	Shift + End (Scroll Lock on)

Extending or Making a Multiple Selection (Extended Keyboard)

In addition to using the Shift key to extend a selection, as described in the preceding table, you can also turn on Extend if you have function keys on your keyboard. To turn on Extend, press F8. While in Extend, use any of the Direction keys to extend the selection. To turn off Extend, press F8 again.

Tip Another way to move quickly to a specific cell, range, or named area on the worksheet is to use the Formula Goto command. You can also extend the selection from the active cell to the Goto area by pressing F8 before you choose the command or by holding down Shift when you click the OK button in the Formula Goto dialog box. For more information on finding specific cells or named ranges, see **Finding cells and data quickly.**

To make a multiple selection:

1. Select the first cell.
2. Press F8 to turn on Extend.
3. Press Direction keys to extend the selection.
4. Press Shift + F8 to turn on Add and keep the selection you just made.
5. Move to the next cell or range you want to select.
6. Repeat steps 2–5 to add selections.

Moving Within a Selection

For a range selection or multiple selection, you can use keys in the following table to move around and maintain the selection on the screen:

To move	Press
Down one cell	Return*
Up one cell	Shift + Return*
Right one cell	Tab
Left one cell	Shift + Tab
To next cell	Enter
To previous cell	Shift + Enter

* You can turn off movement with the Options Workspace command so that when you press Return, the same cell remains active.

Scrolling a Worksheet Window (Extended Keyboard)

Scrolling moves the contents of the active window up, down, left, or right so that you see another part of the worksheet. When you scroll through a worksheet, the active cell or selection does not move.

To scroll the active window, use the key combinations in the following table with Scroll Lock turned on. This causes the movement/selection keys to scroll instead of selecting cells. When you are finished scrolling, press Scroll Lock again to turn it off.

To scroll	Turn on Scroll Lock and press
One row up or down	Up or Down Arrow key
One column left or right	Left or Right Arrow key
One window up or down	Page Up or Page Down
One window left or right	Command + Page Up or Command + Page Down
Back to display the active cell	Command + Backspace

If you scroll away from the selection and then want to quickly bring the active cell into the part of the worksheet currently displayed, press Home while Scroll Lock is turned on.

Tip The Options Freeze Panes command allows you to freeze titles in columns or rows. This makes it easy to scroll the worksheet and keep track of which columns and rows you're working in. For more information on freezing titles, see **Windows.**

Command Selection Keys and Shortcut Keys

You can choose commands by using keys to activate menus and select commands from menus, or you can use Command key combinations or function keys to bypass menus and select commands or dialog box options directly. When you use the keyboard to select commands, one letter of each menu, command, or dialog box option displayed is underlined. Pressing the key for the underlined letter chooses that menu or command. In dialog boxes, press Command plus the key for the underlined letter to select the option. With the Options Workspace command, you can change whether the underlines are always displayed, never displayed, or displayed only when you use the keyboard to choose commands. For more information, see **Options Workspace command.**

Choosing Commands from Menus

You can activate the menu bar and select commands from the menus using the keyboard instead of the mouse. Initially, the period key on the keypad (with Num Lock off) and the / key on the keyboard activate the menu bar. Once the menu bar is active, you can use letter keys or the Direction keys and Enter or Return to open menus and select commands.

You can assign the menu key to a key other than the / key on the keyboard with the Options Workspace command. For more information, see **Options Workspace command.** The period key on the keypad always activates the menu bar when Num Lock is off. (Press Shift + Clear (Num Lock) to turn Num Lock on or off.) "NUM" appears in the status bar if Num Lock is on.

To choose a command from a menu:

1. Press the period key on the keypad while Num Lock is off or press the alternate menu key (assigned to the / key initially).

   The File menu name appears selected, indicating that the menu bar is now active.

2. To open the File menu, press Enter or Return.

   To select another menu, press the key for the underlined letter in the name of the menu you want.

   Alternately, to select another menu, use the Right Arrow and Left Arrow keys and press Enter or Return.

3. Press the key for the underlined letter in the command you want to choose.

   Alternately, use the Down Arrow and Up Arrow keys to move the selection to the command you want to choose and press Enter or Return.

Shortcuts for Commands and Dialog Box Options

Command key shortcuts bypass the menus and carry out commands directly, including selecting specific dialog box options.

For information on each command and dialog box option listed, see the corresponding command topic.

Command	Key
Chart Select Chart (chart window only)	Command + A
Data Extract	Command + E
Data Find Next	Command + F
Data Find Previous	Command + Shift + F
Edit Clear	Command + B
Edit Copy	Command + C
Edit Copy Picture	Command + Shift + C
Edit Cut	Command + X

Command	Key
Edit Delete	Command + K
Edit Fill Down	Command + D
Edit Fill Left	Command + Shift + R
Edit Fill Right	Command + R
Edit Fill Up	Command + Shift + D
Edit Insert	Command + I
Edit Paste	Command + V
Edit Paste Special	Command + Shift + V
Edit Repeat	Command + Y
Edit Undo	Command + Z
File Close	Command + W
File New	Command + N
File Open	Command + O
File Print	Command + P
File Quit	Command + Q
File Save	Command + S
File Save As	Command + Shift + S
Formula Define Name	Command + L
Formula Find (opens dialog box)	Command + J
Formula Find Next	Command + H
Formula Find Previous	Command + Shift + H
Formula Goto	Command + G
Formula Note	Command + Shift + N
Formula Reference	Command + T
Options Calculate Now	Command + =

Formula editing command	Key
Activate formula bar	Command + U
Cancel entry	Command + . (period)
Enter formula as an array formula	Command + Return or Command + Enter
Fill selection with formula	Option + Return or Option + Enter

Formula editing command	Key
Insert current date into formula bar	Command + - (hyphen)
Insert current time into formula bar	Command + ; (semicolon)
Insert value of above cell into formula bar	Command + '

Command and dialog box option	Key
Format Border (Outline)	Command + Option + 0 (zero)
Format Border (Left)	Command + Option + Left Arrow key
Format Border (Right)	Command + Option + Right Arrow key
Format Border (Top)	Command + Option + Up Arrow key
Format Border (Bottom)	Command + Option + Down Arrow key
Format Number (General format)	Command + Option + ~
Format Number (0.00 format)	Command + Option + !
Format Number (h:mm AM/PM format)	Command + Option + @
Format Number (d-mmm-yy format)	Command + Option + #
Format Number ($#,##0.00;($#,##0.00) format)	Command + Option + $
Format Number (0% format)	Command + Option + %
Format Number (0.00E+00 format)	Command + Option + ^
Formula Select Special (Notes option)	Command + Shift + O (letter o)
Formula Select Special (Current Region option)	Command + *

Command and dialog box option	Key
Formula Select Special (Row Differences option)	Command + \
Formula Select Special (Column Differences option)	Command + Shift + \
Formula Select Special (Precedents: Direct Only option)	Command + [
Formula Select Special (Precedents: All Levels option)	Command + Shift + [
Formula Select Special (Dependents: Direct Only option)	Command +]
Formula Select Special (Dependents: All Levels option)	Command + Shift +]
Options Display Formulas (toggles between formulas and values)	Command + ‘ (left single quotation mark)

Function Key Shortcuts for Commands and Actions (Extended Keyboard)

The function key shortcuts serve as convenient alternatives for choosing many of the most often used worksheet, chart, and macro sheet commands directly from the keyboard. Function key shortcuts bypass menus and carry out commands and actions directly from the keyboard.

For information on each command listed, see the corresponding command topic.

Key		Command or Action
F1	F1	Edit Undo command
	Shift + F1	Context-sensitive Help
F2	F2	Edit Cut command
	Shift + F2	Formula Note command
	Command + F2	Window Show Info command
F3	F3	Edit Copy command
	Shift + F3	Formula Paste Function command
	Command + F3	Formula Define Name command
	Command + Shift + F3	Formula Create Names command

Key	Command or Action
F4	Edit Paste command
Command + F4	File Close command (active window)
F5	Formula Goto command
Shift + F5	Formula Find command (find cell with specific contents)
Command + F5	Restore (decrease) window size
F6	Next pane
Shift + F6	Previous pane
Command + F6	Next document window
Command + Shift + F6	Previous document window
F7	Formula Find command (find next cell)
Shift + F7	Formula Find command (find previous cell)
Command + F7	Move active document window
F8	Turn Extend on or off; if you are already in Add, changes to Extend
Shift + F8	Turn on Add
Command + F8	Size active document window
F9	Options Calculate Now command
Shift + F9	Options Calculate Document command
F10	Activate menu bar
Command + F10	Enlarge active document window
F11	File New command (Chart option)
Shift + F11	File New command (Worksheet option)
Command + F11	File New command (Macro sheet option)
F12	File Save As command
Shift + F12	File Save command
Command + F12	File Open command
Command + Shift + F12	File Print command

Miscellaneous Keyboard Features

Here are some other keyboard conveniences you can use with Microsoft Excel:

- **"Accountant's keypad" feature.** You can set up "fixed decimals" with Microsoft Excel just as you would on a 10-key adding machine. With the Options Workspace command (Fixed Decimal check box), you can specify a number of decimal places, and Microsoft Excel will automatically insert the decimal point correctly for each number you enter. If you use the numeric keypad (located on the right side of most keyboards) to enter the numbers, be sure to turn on Num Lock. For more information, see **Options Workspace command.**
- **Quick scrolling.** Within the Help window and in any dialog box that contains a list box and no text box, you can scroll quickly by typing the first letter of the item you want. The list box or Help window scrolls to the first item starting with that letter. If there is more than one item beginning with that letter, you can press the letter key again to see each of those items. This technique applies to the dialog boxes for the File Open, File Links, File Delete, Formula Paste Name, and Formula Paste Function commands.
- **Shortcut keys for macros.** As a shortcut for the Macro Run command, you can run a command macro with a shortcut key you define when you record the macro. The key combinations of Command + Option and any alphabetic key are reserved for assignment to macros that you define. For more information on recording a macro, see **Macro.**
- **Switching between document windows.** You can activate the next document window by pressing Command + M. To activate the previous document window, press Command + Shift + M. Press either key combination repeatedly to rotate through all of the open documents.

Related Information

Reference

For information on	See
Worksheet basics, including summary chart of parallel keyboard procedures for the worksheet and formula bar	Worksheet
General overviews of editing and formatting a worksheet	Worksheet Editing a document Formatting a document

Linking documents

You **link** two documents by creating a formula in one that refers to a value in the other. The link enables Microsoft Excel to update the value in the reference whenever the value changes in the other worksheet. Linking enables you to consolidate data among several worksheets or data sources in other applications. You can link two or more Microsoft Excel worksheets.

This topic explains:

- Basic concepts of linking

  Essential terms

- Linking Microsoft Excel worksheets

  Parts of an external reference formula
  Guidelines for linking worksheets
  Creating a link between worksheets
  Saving linked worksheets
  Opening and updating linked worksheets
  Managing linked worksheets in different folders
  Redirecting links for worksheets you rename or move
  Removing links between worksheets

Note When you create a new chart from a worksheet, Microsoft Excel automatically links the chart to the worksheet. This topic does not discuss links between a chart and worksheet, which use a special kind of formula called a series formula. For information on series formulas, see **Series formula.**

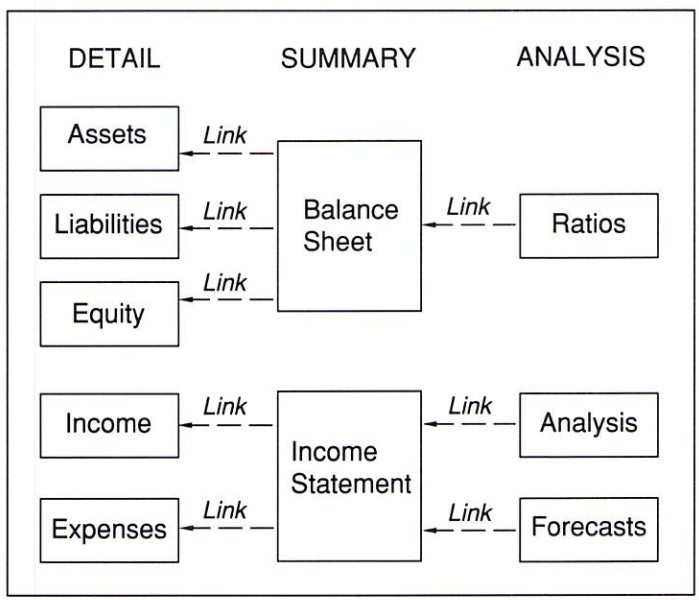
Basic Concepts of Linking

Linking is especially useful for working with large worksheet models or systems of documents. Here are a few ways you can benefit by using linking:

- **Consolidating data from several worksheets.** For example, you can link worksheets from different departments or several users, and integrate the pertinent data into a master summary worksheet. Breaking down a large model into smaller linked worksheets enables several users to work on the model simultaneously.

- **Creating different versions of your data.** For example, you can create a working copy of the data that includes extra information or tables for calculation, intermediate results, and no special formats. To your working copy, you can link a final version of the worksheet for reports, including special formats and data pertinent only to the reports. You can use the same worksheet as the source of several reports.
- **Streamlining large, complex models.** For example, you can break down a complicated financial model into a series of compact, interdependent worksheets. You save memory because you can work on the model without opening all worksheets related to it. Smaller worksheets are faster to open, calculate, and save, and are easier to edit.
- **Designing flexible models or systems.** For example, you might design an effective model around separate worksheets for models you deal with daily and those you work with only periodically. Again, more compact worksheets streamline your work significantly.

Linking is not restricted to simple links between two documents; you can construct hierarchies of linked documents. The following illustration shows a possible accounting model based on worksheets linked this way:



Essential Terms

The following terms apply to linking documents and are used throughout this topic:

- **External reference** — a reference to another Microsoft Excel worksheet. An external reference can designate a single cell, a cell range, or a named cell or range.
- **External reference formula** — a formula in a worksheet that contains a reference to a single cell, cell range, or named cell or range in another worksheet. An external reference formula creates the actual link between Microsoft Excel worksheets.
- **Dependent worksheet** — a worksheet that contains an external reference formula. When you link two Microsoft Excel worksheets, the dependent worksheet relies on another worksheet for the value in the external reference formula.
- **Supporting worksheet** — a Microsoft Excel worksheet referred to by an external reference. The supporting worksheet is the source of the value contained in the external reference formula and therefore provides "supporting data" to the dependent worksheet.

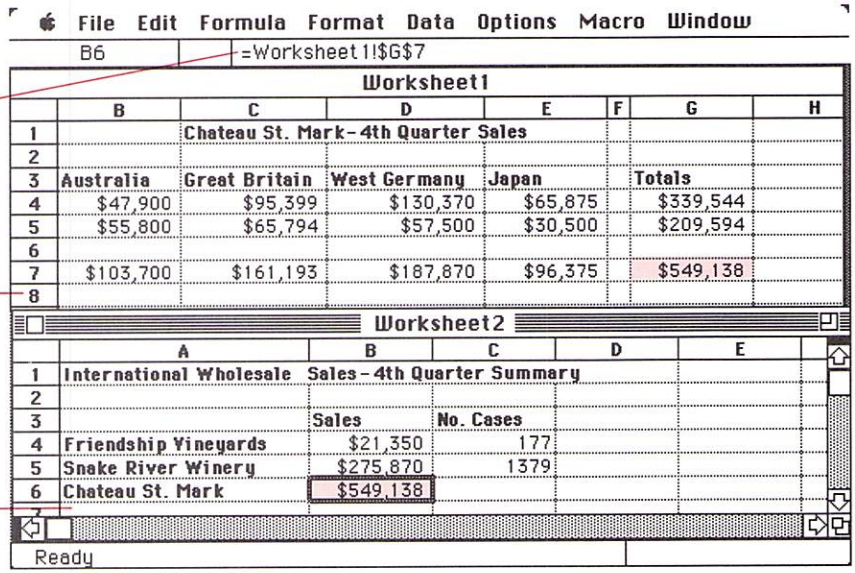
Linking Microsoft Excel Worksheets

Any time you build a formula or define a name in one worksheet by entering a reference to a cell, cell range, or name from another worksheet, Microsoft Excel links those worksheets. The following illustration shows a simple link between two Microsoft Excel worksheets:

External reference formula links cell B6 in Worksheet2 to cell G7 in Worksheet1.

Supporting document provides the value for the external reference formula.

Dependent document contains external reference formula.



Parts of an External Reference Formula

Here's a closer look at the external reference formula used to link the worksheets in the preceding illustration:

An external reference formula must have this syntax:

- **Name of worksheet being referred to** — must always be followed immediately by an exclamation point (!). It must be a legal Microsoft Excel name (for information on guidelines for legal Microsoft Excel names, see **Names**). If it is not a legal Microsoft Excel name, it must be enclosed in single quotation marks.

- **Cell, range, named cell, or range referred to** — can be a simple external reference (an absolute reference to a cell, cell range, named cell or range or named constant in the other worksheet) or a complex external reference (any type of reference other than a simple external reference). In the preceding example, =Worksheet1!$G$7 is a simple external reference formula. Changing it to =Worksheet1!$G$7+Worksheet2!$G$7 would make it a complex external reference.

Guidelines for Linking Worksheets

Follow these guidelines when deciding how you want to set up links between worksheets:

- **In general, use simple external reference formulas.** The difference between simple and complex external reference formulas is important when you build external reference formulas to create links, or when you open linked worksheets. Microsoft Excel can update values for simple external references without supporting worksheets being open. This makes the most efficient use of memory with large models or multiple-sheet models because you don't have to open all supporting worksheets. However, for Microsoft Excel to update complex external references, supporting worksheets must be open.
- **Use names to ensure that external references are correctly adjusted when you edit the worksheet.** When you move or cut cells, Microsoft Excel adjusts external references differently than normal references. When you move supporting cells, external references in dependent formulas are not adjusted to reflect the new location of the supporting cells. Using names in external references ensures that the formulas will always refer to the data you originally referenced.
- **Use complex external reference formulas only when necessary.** A simple external reference formula should cover most linking conditions. Check the logic of your model if you think you need to use anything other than a simple external reference formula. If you're not sure whether your model requires a complex external reference formula, refer to the following table for syntax examples that contrast simple and complex external reference formulas.

Simple external reference formula	Complex external reference formula
=BUDGET!$B$1 (absolute reference)	=BUDGET!B1 (relative reference)
=BUDGET!$B$1:$B$5 (range)	=SUM(BUDGET!$B$1:$B$5) (function using range)
=BUDGET!Inflation (if the name Inflation refers to a cell, range, or constant)	=BUDGET!Inflation (if the name Inflation refers to a formula, such as =B78)

Tip The most common complex references are consolidation formulas such as =EAST!$B$3+WEST!$B$3. You can avoid using this kind of reference by entering each component reference in its own cell and consolidating the results in another cell. In the above example, you could enter =EAST!$B$3 in one cell, =WEST!$B$3 in another cell, and then add the result of these two cells in a third cell.

Creating a Link Between Worksheets (Full Menus)

Note When you use the following steps to link worksheets, Microsoft Excel automatically creates a simple external reference formula — one using absolute references. Simple external reference formulas should cover most conditions for linking worksheets. If you think you need to use a complex external reference formula, see "Guidelines for Linking Worksheets," earlier in this topic.

1. Open the worksheets you want to link.
2. Activate the supporting worksheet window.
3. Select the cell or range you want to be referenced in the dependent worksheet.
4. Choose Edit Copy.
   The dotted marquee appears around the selected cell or range.
5. Activate the dependent worksheet window.
6. Select the cell or the upper-left corner of the range that will contain the external reference.
7. Choose Edit Paste Link.
   Microsoft Excel creates the external reference formula that links the worksheets.

Note If the worksheet data to be linked is not accessible when you establish a link by entering the formula, Microsoft Excel displays a message. For information on corrective steps you can take, see "Opening and Updating Linked Worksheets," later in this topic.

You can also create a link by typing the external reference formula in the formula bar. For example, entering =Worksheet1!$A$1 as the formula for a cell links that cell to cell A1 in the worksheet called Worksheet1. For information on entering formulas, see **Formula** and **Formula bar.**

Saving Linked Worksheets

You should save supporting worksheets before saving the dependent worksheet linked to them. This ensures that document names in external references are current. Anytime you name or rename a supporting worksheet, the dependent worksheet must be open for the name change to be updated in the external reference.

If you try to save a dependent document that contains a reference to an unsaved supporting worksheet, Microsoft Excel displays a message. Click the Cancel button and follow the appropriate procedure:

To save new, unnamed linked worksheets

1. Activate the supporting worksheet window.
2. Choose File Save or File Save As.
3. Type a document name in the text box.
4. Click the OK button.
5. Follow steps 1–4 for each additional supporting worksheet.
6. Activate the dependent worksheet window.
7. Choose File Save or File Save As.
8. Type a document name in the text box.
9. Click the OK button.

To save changes in previously linked worksheets

1. Activate the supporting worksheet window.
2. Choose File Save.
3. Follow steps 1–2 for each additional supporting worksheet.
4. Activate the dependent worksheet window.
5. Choose File Save.

Important If you save linked worksheets in different folders, make sure you use the File Save As command to save all supporting worksheets before you save the dependent worksheet. For information on managing linked files in different folders, see "Redirecting Links for Worksheets You Rename or Move," later in this topic. For information on working with folders, see **Folders.**

Opening and Updating Linked Worksheets (Full Menus)

You can easily open one or more supporting worksheets for the active dependent worksheet with the File Links command. You can also use this command to view a list of the supporting worksheets.

Use the following guidelines for opening or updating linked worksheets with the File Links command:

- **Dependent worksheets with simple external references** — If you open a dependent worksheet before opening its supporting worksheets or if you choose to leave supporting sheets closed to save memory, Microsoft Excel displays a message asking if you want to update references to nonresident worksheets. Click the OK button to update simple external references. Click the Cancel button if you want to use the last values in the simple external reference formulas.
- **Dependent worksheets with complex external references** — If you open a dependent worksheet with complex external reference formulas before you open the supporting worksheets, you'll see the #REF! error value in cells containing the formulas. To resolve the error values and update the references, open the supporting worksheets.
- **External references for open or closed supporting worksheets** — External references are displayed differently in the dependent worksheet, depending on whether the supporting worksheets are open. When viewed in the formula bar, an external reference to a supporting worksheet that is closed is displayed with the full folder information — drive, folder, and name of document (for example, LEGAL:TABLES:TAX!$A$1). If the supporting worksheet is open, it appears with only the document name (for example, TAX!$A$1).
- **Worksheets with the same document name in different folders** — If you have multiple supporting worksheets with the same basic document name in different folders, you can open only one of those documents at a given time. For example, if you open a document called EAST from the WORK:REGIONS folder, you cannot also open another document called EAST from a different folder.

Important If you have renamed a supporting worksheet or have saved a supporting or dependent worksheet in a different folder, you may have to redirect the links. For more information, see "Managing Linked Worksheets in Different Folders," later in this topic. For information on working within folders, see **Folders.**

To open or view the list of the supporting worksheets for the active worksheet with the File Links command:

1. Make sure the dependent worksheet is open and in the active window.
2. Choose File Links.

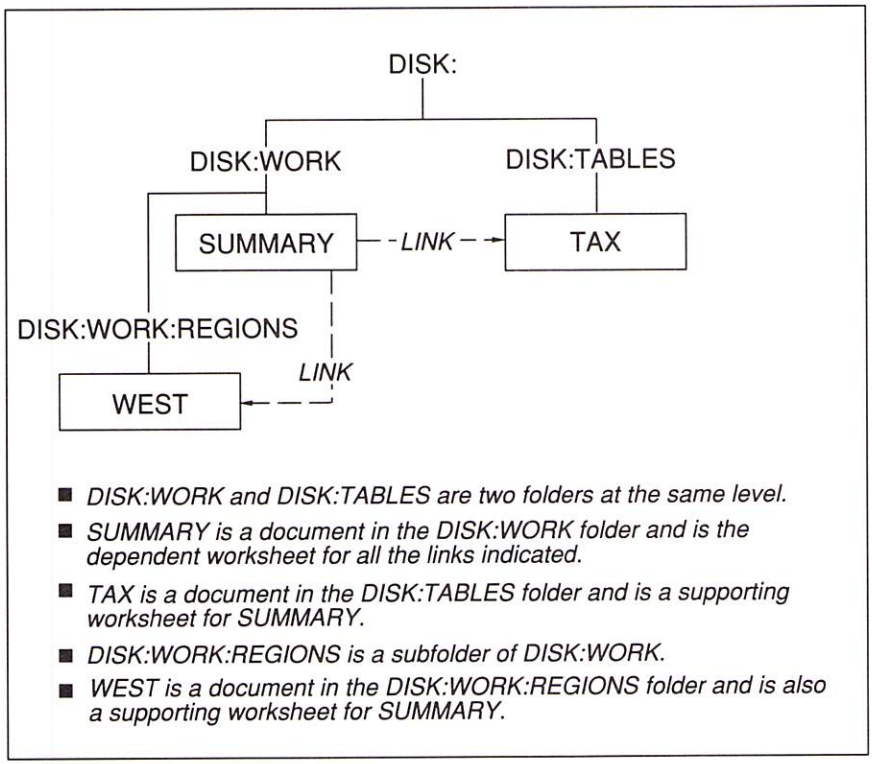
   The dialog box displays a list of all supporting worksheets for the dependent worksheet.
3. Select the names of the worksheets you want to open from the list box.

   To select several documents at one time in the list box, hold down the Shift key and click each document you want to open.
4. Click the Open button to open the sheets. If you are just viewing the list, click the Cancel button when you are finished.

For more information, see **File Links command.**

Managing Linked Worksheets in Different Folders

Whenever possible, you should try to save linked worksheets in the same folder. However, you might find it more efficient to set up certain models with linked worksheets in different folders, as shown in the following illustration.



- *DISK:WORK and DISK:TABLES are two folders at the same level.*
- *SUMMARY is a document in the DISK:WORK folder and is the dependent worksheet for all the links indicated.*
- *TAX is a document in the DISK:TABLES folder and is a supporting worksheet for SUMMARY.*
- *DISK:WORK:REGIONS is a subfolder of DISK:WORK.*
- *WEST is a document in the DISK:WORK:REGIONS folder and is also a supporting worksheet for SUMMARY.*

The following guidelines apply to managing linked worksheets in different folders:

- **Save the supporting worksheets before saving the dependent worksheet to correctly maintain links.** Use the File Save As command, and, in the File Save As dialog box, type the full folder information (drive, folder name, and document name). This ensures that Microsoft Excel can track the link and update references correctly. For example, if you're saving the supporting worksheet TAX and dependent worksheet SUMMARY for the first time after creating the link, you should select the folder TABLES before saving the document TAX.

- **If you move Microsoft Excel documents between folders, you should also move all linked worksheets stored in the same folders or in subfolders of that folder.** This is because Microsoft Excel tracks linked worksheets in "relative" terms if the worksheets are originally stored in the same folder or a subfolder thereof. In the preceding illustration, Microsoft Excel tracks the external reference in SUMMARY to WEST as "one subfolder down." However, Microsoft Excel tracks supporting worksheets outside a given folder (or its subfolders) in "absolute" terms (like an absolute reference in worksheet cells). For example, if you move SUMMARY to a different folder, you should also create a REGIONS subfolder in that folder and move WEST to the REGIONS subfolder to correctly maintain the links. On the other hand, if you moved SUMMARY to a new folder, its link to TAX would not be affected.
- **Redirect the links, if necessary.** If you haven't followed these guidelines, your links may be disconnected. When you try to open a dependent worksheet, Microsoft Excel displays a message indicating that it can't find the supporting worksheet. If this happens, use the File Links command to redirect links for dependent or supporting worksheets you've moved to different folders. This procedure lets Microsoft Excel reestablish the links and update references properly. For information on this procedure, see the next section in this topic.

For more information on working with folders, see **Folders.**

Redirecting Links for Worksheets You Rename or Move (Full Menus)

Use this procedure to redirect links if you:

- Renamed a supporting worksheet without the dependent worksheet being open
- Moved a dependent or supporting worksheet to another folder without opening the linked worksheets and first saving the supporting worksheets and then the dependent worksheet with the File Save As command

Note If you moved a linked worksheet and the links are only to documents in other folders, rather than to documents in the same folder or a subfolder thereof, you don't need to redirect links. For more information, see the previous section in this topic. For information on working with folders, see **Folders.**

To redirect links for supporting worksheets you rename or move:

1. Open the dependent worksheet.
2. Choose File Links.
3. Select the name of the supporting worksheets you want to redirect links for.

   To select several documents at one time in the list box, hold down Shift and click each document you want to select.
4. Click the Change button.

   Microsoft Excel displays a dialog box for each document you selected.
5. In the text box, type the complete, new document name, including its folder information.
6. Click the OK button.
7. Follow steps 5–6 for each document you selected.

Removing Links Between Worksheets

You remove links in one of three ways, depending on how the link is used and if you want to keep it:

- **"Freeze" the value of an entire external reference formula.** This removes the link and finalizes the formula as a value in the dependent worksheet. Use the following procedure if the external reference formula comprises the entire formula for a cell.

  1. Select the cell or cells with external references.
  2. Choose Edit Copy.
  3. Choose Edit Paste Special.
  4. Select the Values option.
  5. Click the OK button.

- **"Freeze" the value of an external reference that is part of a larger formula.** This freezes only the value for the external reference portion of a larger formula in the dependent worksheet. Use the following procedure if you want to preserve the rest of the formula as a formula and not a value. Note that this procedure explicitly replaces the external reference with the value of the external reference.

1. Select the cell with the external reference.
2. In the formula bar, select the external reference part of the formula.
3. Choose Options Calculate Now.
4. Press Enter or click the enter box.

- **Delete all external references to the supporting worksheet from the dependent worksheet.** This erases the external references entirely from the dependent worksheet. Use the following procedure if you no longer need the values from the supporting worksheet in the dependent worksheet.

1. Select the cell with the external reference.
2. Press Backspace to delete the reference from the formula bar.
3. Press Enter or click the enter box.

Tip To make sure all links are deleted, you can use the Formula Replace command to search for and replace formulas. Type the formula you want to replace in the Find What box; type what you want as the replacement in the Replace With box; and select the Formulas option. When you click the OK button, Microsoft Excel replaces the old formula with the new data. For more information, see **Formula Replace command.**

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Controlling windows	Windows
Copying or moving data between Microsoft Excel documents	Copying data and formats Moving data on a worksheet

Sampler

Calculating a Sales Commission

Analyzing the Break-even Point

Consolidating Reports

Logical value

In Microsoft Excel, a **logical value** is either the value TRUE or the value FALSE. Usually, logical values result from formulas that contain a logical function, or an equation that is either true or false, such as $=1>0$. Logical values can also reside in a cell as constant values if you type them in directly.

Microsoft Excel recognizes the words "true" and "false" as logical values regardless of capitalization, and converts the words to all capitals. Microsoft Excel also recognizes the values of one and zero (1,0) as logical values, 1 being TRUE and 0 being FALSE.

For information on using logical values in functions, see *Microsoft Excel Functions and Macros*.

Lookup table

A **lookup table** is a range of cells used by the worksheet functions HLOOKUP, VLOOKUP, and LOOKUP. These functions look up a value you specify and return a value from the lookup table as the result of the function.

To use a lookup table, enter the data in a range of cells, then use the appropriate worksheet function to look up values in the table. Lookup tables are useful for having Microsoft Excel find data in a table of values. For example, a worksheet that calculates shipping and handling charges might use a lookup table that lists shipping charges based on how far an item must be shipped.

This topic explains:

- Setting up a lookup table
- Using the HLOOKUP, VLOOKUP, and LOOKUP functions

Setting Up a Lookup Table

Set up your lookup table so that the first column or row contains the compare values and the rest of the table contains the data. Compare values must be listed in ascending order. The lowest value must be at the top of the column, or the left of the row, and compare values should ascend as you move down the column or across the row.

The order of values, from lowest to highest, is as follows:

- Negative numbers (... − 11, − 10, − 9...)
- Zero (0)
- Positive numbers (...9,10,11...)
- Text values, in alphabetical order (A–Z)
- Logical values (FALSE, TRUE)

Uppercase text (such as "WORD") and lowercase text (such as "word") are equivalent in the lookup functions. For more information on Microsoft Excel's sorting order, see **Sorting data.**

For example, the following lookup table shows the discounts used for different customers, depending on the type of account they have and the amount of their invoice.

	A	B	C
1		Major Account	Other Account
2	Invoice	Discount	Discount
3	0	5%	0%
4	500	7.50%	2.50%
5	1000	15%	5%
6	5000	25%	10%
7	50000	40%	20%
8			

Compare values *Data*

(The table can also be arranged with the compare values in the first row of the table, and the data in the rows below.)

Using the HLOOKUP, VLOOKUP, and LOOKUP Functions

Which function you use depends on how your lookup table is set up.

If	Use
Your compare values are in the first row of the lookup table	HLOOKUP
Your compare values are in the first column of the lookup table	VLOOKUP
Your compare values aren't adjacent to your data	LOOKUP

For example, in the discount lookup table in the preceding illustration, the compare values are in the first column, so you would use the VLOOKUP worksheet function.

For information on each worksheet function, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros.*

Each lookup function has a similar form. The syntax of VLOOKUP is:

VLOOKUP(lookup_value,table_array,col_index)

Lookup_value is the value to look up.

Table_array is the reference of the lookup table.

Col_index is an index number. In VLOOKUP, this tells what column to look in to find the value to return. In HLOOKUP, this tells what row to look in.

In the discount lookup table shown in the preceding illustration, the function VLOOKUP(1200,A3:C7,3) looks in the first column of the table to find the largest value less than or equal to 1200, then looks in the third column of the lookup table to find 5%.

Related Information

Reference

For information on	See
Using worksheet functions	Function

Functions and Macros

"Lookup Functions" in Chapter 2, "Worksheet Function Directory"

Sampler

Calculating a Sales Commission

Lotus 1-2-3

Microsoft Excel can both open and save Lotus 1-2-3 worksheets. This makes it easy for you to use your 1-2-3 worksheets with Microsoft Excel or to exchange Microsoft Excel worksheets with others who may be using 1-2-3. If you are a Lotus 1-2-3 user, you will find that much of what you know applies to Microsoft Excel. You'll also find some useful Help features that will make it easy for you to familiarize yourself with Microsoft Excel.

This topic explains file conversion between Lotus 1-2-3 and Microsoft Excel. At the end of the topic is a table of terminology differences between the two programs. Check this table if you are a 1-2-3 user learning Microsoft Excel, and you come across an unfamiliar term as you read.

This topic explains:

- How to convert files

  Opening a Lotus 1-2-3 worksheet as a Microsoft Excel worksheet
  Saving a Microsoft Excel worksheet as a Lotus 1-2-3 worksheet

- How formulas convert

  Constants, arguments, and operands
  Operators
  Calculation

- How formats convert

  Numbers
  Alignment
  Protection

- How tables and databases convert

  Tables
  Databases

- Terminology differences

The Help Lotus 123 command lets you quickly access the Microsoft Excel online Help system to get information on the Microsoft Excel equivalents of Lotus 1-2-3 commands. For information on Help on Lotus 1-2-3, see **Help.** You'll also find a topic about the Microsoft Excel equivalents of every 1-2-3 function under "Functions" in the Help index.

How to Convert Files

You can open Lotus 1-2-3 files in Microsoft Excel and you can save Microsoft Excel files as Lotus 1-2-3 files. Microsoft Excel understands both 1-2-3 file formats, WKS (Lotus 1-2-3, version 1A) and WK1 (Lotus 1-2-3, version 2.0 or higher). Worksheet files can be transferred in either direction. When you use Microsoft Excel to open a 1-2-3 worksheet that contains graphs, each graph is converted to a Microsoft Excel chart document. Microsoft Excel charts do not convert to 1-2-3.

When you transfer worksheet files between Microsoft Excel and Lotus 1-2-3, the following convert:

- Cell attributes such as formulas, values, formatting, and protection status
- Names

Window and worksheet options such as panes, titles, number of windows, and location of the selection do not convert. Also, printing settings such as margins, headers, and footers do not convert.

Opening a Lotus 1-2-3 Worksheet as a Microsoft Excel Worksheet

You can open any 1-2-3 worksheet as a Microsoft Excel worksheet. Microsoft Excel automatically recognizes WKS file and WK1 file formats. Conversion occurs when you open the file.

1. Choose File Open.
2. In the list box, select the 1-2-3 worksheet name.

   If the worksheet is in a folder different from the one indicated in the dialog box, select the desired folder before opening the worksheet. For more information on working with folders, see **Folders.**
3. Press Enter.

   If the Lotus 1-2-3 worksheet you open has charts associated with it, Microsoft Excel asks you if you want to re-create the charts as Microsoft Excel charts. Click the OK button to re-create the charts, or click the Cancel button to open the worksheet without the charts.
4. Click the OK button.

Saving a Microsoft Excel Worksheet as a Lotus 1-2-3 Worksheet

You can save a Microsoft Excel worksheet in WKS or WK1 format so that the file can be read by Lotus 1-2-3.

1. Choose File Save As.
2. Click the Options button.
3. Select WKS (to convert the file for Lotus 1-2-3, version 1A) or WK1 (to convert the file for Lotus 1-2-3, version 2.0 or higher).
4. In the Save Worksheet As text box, type a name for the 1-2-3 worksheet.

   If you want to save the worksheet in a folder other than the one indicated in the dialog box, select the desired folder before typing a name for the document. For more information on working with folders, see **Folders.**
5. Click the Save button.

How Formulas Convert

Microsoft Excel tries to convert all formulas when you open or save a WKS or WK1 file. If Microsoft Excel encounters a formula that it cannot convert, it displays a message that gives the reference of the cell containing the formula.

The dialog box also asks if you want to see the next formula that cannot convert. If you click the Yes button, this message comes up for the next formula. If you keep clicking the Yes button, you'll see a message for every formula that cannot convert. When you have seen the last message, or whenever you click the No button, a dialog box appears telling you the total number of formulas that did not convert. When a formula does not convert, Microsoft Excel preserves the value of the formula.

Constants, Arguments, and Operands

This section explains how different parts of formulas convert.

Arrays: Lotus 1-2-3 does not support arrays. Any Microsoft Excel formula involving arrays does not convert.

Error values: Microsoft Excel supports the error values #N/A, #VALUE!, #DIV/0!, #NAME?, #NULL!, #NUM!, and #REF! as constants in cells and formulas, and as the result of formulas. Lotus 1-2-3 supports two error values, NA and ERR, and only as the result of formulas. Microsoft Excel has an NA function that produces the error value #N/A, while 1-2-3 has @NA and @ERR functions that produce the values NA and ERR. The Microsoft Excel constant error value #N/A converts to the 1-2-3 @NA function, and all other constant error values convert to @ERR.

Logical values: Microsoft Excel supports the logical values TRUE and FALSE as constants in cells and formulas, and as the result of logical formulas. In Lotus 1-2-3, TRUE and FALSE are represented by the numbers 1 and 0 in logical formulas and as the results of logical formulas, but they are not considered logical values. Microsoft Excel has TRUE and FALSE functions that produce the values TRUE and FALSE, while 1-2-3 has @TRUE and @FALSE functions that produce the values 1 and 0. The Microsoft Excel constant logical values TRUE and FALSE convert to 1-2-3's functions @TRUE and @FALSE.

Names: Lotus 1-2-3 supports range names for single cells and ranges. Microsoft Excel supports these, as well as named constant values, named formulas, and named references to multiple selections. Named constants and named formulas in Microsoft Excel do not convert as names in 1-2-3. Rather, formulas that use such names will contain the constant or formula, enclosed in parentheses, if necessary. Named references to multiple selections do not convert.

Numbers: Both Lotus 1-2-3 and Microsoft Excel allow numbers as constants in cells and in formulas, and allow formulas that produce numbers as results.

Text: Both programs allow text as constants in cells. Microsoft Excel and Lotus 1-2-3, version 2.0 and higher, allow text constants to be included in formulas, as well as formulas that produce text as a result; Lotus 1-2-3, version 1A, does not. Thus, any Microsoft Excel formula containing a text argument or operand can convert when you save to WK1, but not to WKS.

References: Microsoft Excel supports references to single cells, to ranges of cells, and to multiple selections. Lotus 1-2-3 supports references to single cells and to ranges of cells, but not to multiple areas. Lotus 1-2-3 version 1A does not allow functions that produce references as a result. No version of 1-2-3 has operators that produce references like the Microsoft Excel intersection ( ), range (:), and union (,) operators.

Any Microsoft Excel formula involving a reference to multiple selections does not convert. The Lotus 1-2-3 version 1A worksheet is 2,048 rows by 256 columns, and its version 2.0 (or higher) worksheet is 8,192 rows by 256 columns. The Microsoft Excel worksheet is 16,384 rows by 256 columns. Therefore, any references in a Microsoft Excel worksheet to rows beyond 2,048 or 8,192 do not convert when you save to WKS or WK1, respectively. Also, 1-2-3 does not support external references to other worksheets, so any Microsoft Excel formulas containing external references do not convert.

Operators

Microsoft Excel supports these operators in the following order of evaluation:

:

Space

,

+ or − (unary)

%

^

* or /

+ or −

&

= < > <= >= <>

Lotus 1-2-3 supports the following operators in the following order of evaluation:

^

+ or − (unary)

* or /

+ or −

= < > <= >= <>

#NOT# (unary)

#AND# #OR#

& (version 2.0 or higher, only)

In Lotus 1-2-3, the exponentiation operator (^) is evaluated before the negation operator (−); in Microsoft Excel, negation is evaluated first. So, the formula = −2^4 produces the value −16 in 1-2-3, and 16 in Microsoft Excel. Lotus 1-2-3 does not have a union operator (,) or an intersection operator ( ). Microsoft Excel formulas containing one of these operators do not convert. A concatenation operator (&) is supported in 1-2-3, version 2.0 or higher, but not in version 1A.

Lotus 1-2-3 does not use a range operator (:) like Microsoft Excel. In 1-2-3, you can express a range using two dots, as in A1..C3. However, if A1 is named Top and C3 is named Bottom, you can't enter a range as Top..Bottom. Lotus 1-2-3 does not have a percentage (%) operator either. An expression such as 3% in a Microsoft Excel formula converts to 0.03 in 1-2-3.

Microsoft Excel does not have #AND#, #OR#, or #NOT# operators; it uses the AND, OR, and NOT functions instead. In conversion, the operators convert to the functions and vice versa.

Calculation

In Lotus 1-2-3, you can calculate a worksheet by row, by column, or by natural order (according to dependent formulas). Microsoft Excel supports only natural order. In conversion, order of calculation is always made natural.

Lotus 1-2-3 and Microsoft Excel both support automatic and manual calculation, but 1-2-3 automatic calculation is actually equivalent to "automatic except tables" calculation in Microsoft Excel. Automatic in Microsoft Excel includes the calculation of tables since tables in Microsoft Excel are formulas. In conversion from Microsoft Excel to 1-2-3, automatic and "automatic except tables" convert to automatic, and manual converts to manual. Both 1-2-3 and Microsoft Excel let you specify a number of iterations. In addition, Microsoft Excel lets you specify a maximum change between iterations. Only the number of iterations converts.

How Formats Convert

Numbers

Microsoft Excel converts Lotus 1-2-3 number formats according to the following table. Microsoft Excel converts to a format with the same number of decimal places as specified in 1-2-3. If necessary, Microsoft Excel creates a custom format to accommodate extra decimal places.

In conversion from Microsoft Excel to Lotus 1-2-3, number formats convert according to the same table. Microsoft Excel formats other than those in the table are formatted as General in 1-2-3.

Lotus 1-2-3 format	Microsoft Excel format
+/−	General
Comma, 0 decimals	#,##0 ;(#,##0)
Comma, 2 decimals	#,##00.00 ;(#,##0.00)
Currency, 0 decimals	$#,##0 ;($#,##0)
Currency, 2 decimals	$#,##0.00 ;($#,##0.00)
Date1 (dd-mmm-yy)	d-mmm-yy
Date2 (dd-mmm)	d-mmm
Date3 (mmm-yy)	mmm-yy

Lotus 1-2-3 format	Microsoft Excel format
Fixed, 0 decimals	0
Fixed, 2 decimals	0.00
General	General
Hidden (version.2.0 or higher)	;
Percent, 0 decimals	0%
Percent, 2 decimals	0.00%
Scientific, 0 decimals	0E+00
Scientific, 2 decimals	0.00E+00
Text	General

Alignment

In Lotus 1-2-3, cells containing text can be aligned to the left, right, or center; or text can be repeated to fill the cell. In conversion, these formats translate to Left, Right, Center, and Fill alignments in Microsoft Excel. Numbers in 1-2-3 are always right-aligned, and will remain so in conversion. The default alignment (global) in 1-2-3 does not convert.

In Microsoft Excel, you can align the contents of any cell. In conversion from Microsoft Excel to Lotus 1-2-3, cells that contain constant text have their alignment preserved. All non-text cells become right-aligned.

Protection

Cells that are protected in Lotus 1-2-3 are protected (locked) in Microsoft Excel and vice versa. In Microsoft Excel, you can also hide cell formulas. Hidden formulas are visible when converted to 1-2-3.

Note Both Microsoft Excel and 1-2-3, version 2.0 or higher, have a number format that hides cell values. For more information, see "Numbers," earlier in this topic.

How Tables and Databases Convert

Tables

Microsoft Excel tables are slightly different from those in Lotus 1-2-3. Because Microsoft Excel tables are formulas, they can be calculated automatically like all other formulas on the worksheet. In 1-2-3, tables have to be calculated with a command or function key.

Lotus 1-2-3 requires the input values in a one-input table (Data table 1) to be in the first column of the table range. Microsoft Excel lets a one-input table have its input values either in the first column or the first row of the table.

When converting tables in either direction, the formulas and values in the top row and left column, as well as the values within the tables, are converted. To calculate the tables after conversion, you have to specify them as tables again.

Databases

Microsoft Excel and Lotus 1-2-3 database commands and actions are similar. The Microsoft Excel database range and criteria range correspond to the 1-2-3 input range and criterion range, respectively. Both ranges convert in either direction. Microsoft Excel and 1-2-3 can both extract database records, but the 1-2-3 output range does not convert to a Microsoft Excel extract range since Microsoft Excel extracts to the current selection.

There are minor differences in the ways Microsoft Excel and Lotus 1-2-3 interpret database criteria. For information on how criteria are specified, see your Lotus 1-2-3 manual, and **Database** in this manual.

Some Microsoft Excel database functions (such as DPRODUCT) have no equivalents in Lotus 1-2-3.

Terminology Differences

Lotus 1-2-3 and Microsoft Excel use many similar terms, but differences do exist. The following table compares differing terms:

Lotus 1-2-3	Microsoft Excel
Cell address/reference	Cell reference
Copy	Copy and paste
Current cell	Active cell
Data table 1	One-input table
Data table 2	Two-input table
Erase	Clear
Formula criteria	Computed criteria
Graph	Chart
Highlight	Select
Input range	Database range

Lotus 1-2-3	Microsoft Excel
Labels	Text constants
Label/matching criteria	Comparison criteria
Move	Cut and paste
Number/matching criteria	Comparison criteria
Output range	Extract range
Print range	Print area
Protected cell	Locked/protected cell
Retrieve	Open
Strings	Text
Worksheet titles	Freeze panes
Window	Pane
XY graph	Scatter chart

Related Information

Reference

For information on	See
Opening and saving documents in Microsoft Excel	Opening a document Saving and closing a document
Formulas and operators in Microsoft Excel	Formula Formula bar Operator
Data tables and lookup tables in Microsoft Excel	Data table Lookup table
Using database features in Microsoft Excel	Database
Overview of formatting options (display and print)	Formatting a document
Overview of built-in worksheet functions and macros in Microsoft Excel	Function Macro

Sampler

Creating an Automated Invoice System

Macro

A **macro** is a set of instructions that you create for Microsoft Excel to follow. You store the macro so you can use it any time. Think of macros as a shortcut: a keystroke or two tells the macro to carry out your instructions — whether for routine tasks, such as worksheet formatting, or complex number-crunching with specialized formulas.

Macros are also the key to customizing. With the functions, menus, and dialog boxes you define, you can use macros to create customized applications that work with Microsoft Excel.

This topic includes:

- Overview of macros

  Types of macros
  Macro tools

- Procedures for using command macros

  Recording a command macro
  Running a command macro

- A closer look at function macros

  Using function macros

This topic explains only the basics of working with Microsoft Excel macros. For complete information on macros, see *Microsoft Excel Functions and Macros.* For ideas and examples for using macros, see *Microsoft Excel Sampler.*

Overview of Macros

Macros can be very simple or extremely complex. No matter how elementary or complex the macro, the time invested in creating the macro buys you extra time and accuracy, while saving you considerable effort in the long run.

For example, if you create a regular monthly summary using data on worksheets supplied by four people, imagine creating the summary with just a few keystrokes. The macro you've designed for this purpose can open the correct documents, gather the data, enter the data in the summary, and format it to your specifications.

Macros are particularly effective for:

- **Automating frequently performed tasks — simple or complex.** For example, you may tend to repeat steps when creating a new worksheet or performing a task. Any procedure in Microsoft Excel that you find yourself doing repeatedly is a good candidate for a macro.
- **Creating custom calculation tools and simplifying complex worksheets.** If you work with specialized formulas and complex calculations, you can create your own functions to extend the Microsoft Excel calculation capabilities beyond the built-in worksheet functions.
- **Designing custom applications that work with Microsoft Excel.** You can use macros to develop specialized applications with menus and dialog boxes tailored to your design. Interactive macros will pause and request data from the user while they run. If you create applications for other users less familiar with spreadsheets, such macros can become your mainstays.

In short, a macro is a powerful way of doing the most in the least amount of time with the greatest accuracy.

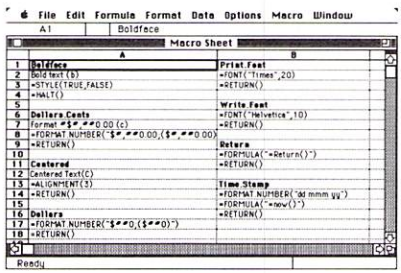
Types of Macros

In Microsoft Excel you can create two kinds of macros: command macros and function macros.

- A **command macro** automatically carries out a planned sequence of actions, such as choosing commands, entering data, and selecting cells or parts of a chart.
- A **function macro** is a "user-defined function." Function macros take values, make calculations, and return values, just like the built-in worksheet functions.

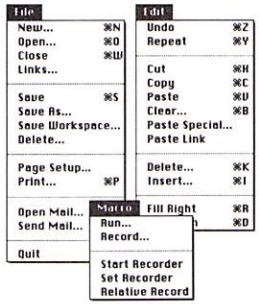
Macro Tools

Here's a quick survey of the Microsoft Excel main macro tools:



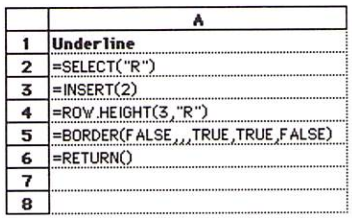
Macro sheet

You create and store a Microsoft Excel macro on a macro sheet. One macro sheet can contain many macros, so you can conveniently group macros related to a set of tasks. Because macros aren't confined to particular worksheets, you can use the same macro with any worksheet you want.



Commands

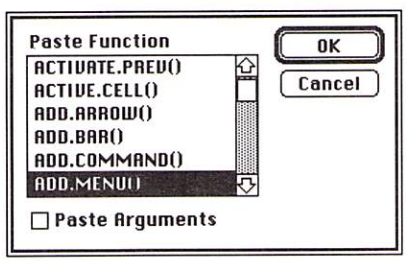
You use commands on the File menu to create, save, and open macro sheets, just as you do other documents. You use commands on the Edit menu to edit a macro sheet, just as you edit a worksheet. With the commands on the Macro menu, you create, name, and run macros.



	A
1	**Underline**
2	=SELECT("R")
3	=INSERT(2)
4	=ROW.HEIGHT(3,"R")
5	=BORDER(FALSE,,,TRUE,TRUE,FALSE)
6	=RETURN()
7	
8	

Macro recorder

With the recorder, creating a command macro is easy. You simply switch on the recorder (using the Macro menu) and carry out the commands and actions you want the macro to perform; meanwhile, the recorder enters each instruction of the macro — correct syntax and all — on the macro sheet for you.



Functions

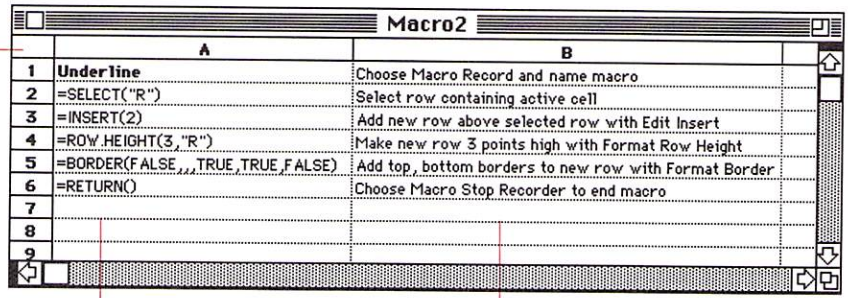
Functions are the building blocks used to create a macro. Any worksheet function, such as SUM or AVERAGE, can be used in a macro. Another set of functions, called macro functions, are for use only in macros. (Note that a macro function is not the same as a function macro. You create a command macro or a function macro from macro functions.)

For complete information on macros, as well as directories of the worksheet functions and macro functions, see *Microsoft Excel Functions and Macros.*

Procedures for Using Command Macros

The easiest way to create a command macro is by recording it. The following example shows a command macro created with the recorder. This macro makes a double underline above the row containing the active cell in a worksheet.

Microsoft Excel automatically records the macro on a macro sheet when you choose the Macro Record command.



Column A shows the actual contents of the macro as Microsoft Excel recorded it.

Comments in column B were added after recording the macro to describe the command or action in each line of the macro.

You could have also typed each line of the macro yourself. But you can edit or fine-tune a recorded command macro later on, so the quickest, easiest way to build an initial command macro is to use the macro recorder.

Recording a Command Macro

Before you start recording a command macro, plan the steps involved and the commands and actions you want to include. If you make a mistake while recording, remember that you can edit the macro later.

1. Choose Macro Record.
   In the dialog box, Microsoft Excel proposes a name and shortcut key combination you can use later to run the macro.
2. Make any changes you want in the proposed name and shortcut key.
   Make sure the name you specify is a legal Microsoft Excel name and that the shortcut key is a single letter.
3. Click the OK button.
   Microsoft Excel opens a macro sheet under your worksheet (unless you've already recorded on an open macro sheet), and enters the macro name. If the status bar is on, the "Recording" message is displayed.
4. Carry out whatever actions you want recorded in the macro.
   Microsoft Excel records the actions on the macro sheet.
5. When you are finished, choose Macro Stop Recorder.

Running a Command Macro

You can run any command macro with the Macro Run command. If you defined a shortcut key when you recorded the macro, you can also run the macro by holding down Option + Command and pressing the shortcut key.

To run a command macro with the Macro Run command

1. If necessary, choose File Open to open the macro sheet containing the command macro.
2. Choose Macro Run.
3. In the list box, select the name of the command macro you want to run, or, in the Reference box, enter the reference of the first cell of the command macro you want to run.
4. Click the OK button.

To run a command macro with a shortcut key

1. If necessary, choose File Open to open the macro sheet containing the command macro.
2. Hold down the Command and Option keys and press the shortcut key you defined when you created the macro.

Since command macros are like the commands built into Microsoft Excel, you can even put them on their own menus. For information on making your own menus and dialog boxes, see Chapter 7, "Custom Menus and Dialog Boxes," in *Microsoft Excel Functions and Macros.*

A Closer Look at Function Macros

Function macros are essentially user-defined functions — custom functions you create that aren't included among the built-in worksheet functions. For example, maybe you regularly use a set of formulas that calculates when a payment is due, based on the date of purchase and the credit rating of the customer. You can enter these formulas on a macro sheet and give them a name such as Due. Then, you can use the Due function on your worksheets, without having to repeatedly build the formulas that compose Due.

Unlike a command macro, a function macro can't be created with the recorder because this type of macro doesn't perform actions — it makes calculations. Instead, you build a function macro by entering formulas and text on a macro sheet. If you've used the worksheet functions, you're already familiar with some of the conventions involved.

Microsoft Excel Functions and Macros fully explains the procedures for creating a function macro. But to give you an idea of what a function macro is like, here's a simple example of what the Due function macro might look like:

Column A of the macro sheet shows the content of the macro.

Each comment in column B describes one line of the macro.

Receive

	A	B	C	D
1	Due			
2	=ARGUMENT("purchasedate",1)	First argument is purchase date	Credit	
3	=ARGUMENT("creditrating",1)	Second argument is credit rating	Rating	Term
4	=VLOOKUP(creditrating,C4:D8,2)	Looks up credit rating to find term	2	30
5	=purchasedate+A4	Adds term to purchase date	4	60
6	=WEEKDAY(A5)	Finds what day of week that is	6	90
7	=IF(A6=1,A5+1,IF(A6=7,A5+2,A5))	If due on weekend, adds 1 or 2	8	100
8	=RETURN(A7)	Returns due date	10	120
9				
10				

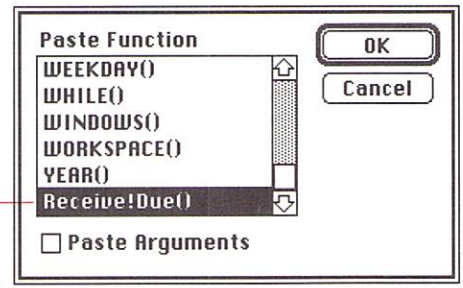
Columns C and D comprise a lookup table for the formula in cell A4 (VLOOKUP function).

Using Function Macros

To use a function macro, first make sure the macro sheet containing the function macro is open, and then enter the function in a formula the same way you enter the built-in worksheet functions. You can do either of the following:

- Type the function name yourself.
  First type the name of the macro sheet that the function is on, then an exclamation mark, and then the name of the function macro. For example: *PAYROLL!FICA()*
- Use the Formula Paste Function command to paste the function.
  In the Formula Paste Function dialog box, Microsoft Excel lists any function macros on all open macro sheets. Choose the Formula Paste Function command, select the function macro you want from the dialog box, and click the OK button. Function macros are listed last in the Formula Paste Function dialog box, so you'll have to scroll the list to see them.

For instance, here's how the example function macro for calculating the due date of a payment would appear in the Formula Paste Function dialog box:



The function macros you create appear at the end of the list in the Formula Paste Function dialog box.

If you can't find the name of the function macro you're looking for in the dialog box, make sure its macro sheet is open. If the macro sheet is open but the name is not listed, the function macro's name probably wasn't defined. For information on defining function macro names, see *Microsoft Excel Functions and Macros.*

Related Information

Reference

For information on	See
Microsoft Excel built-in worksheet functions	Function

Functions and Macros

For complete information about the worksheet functions and about macros

Sampler

Solving Simultaneous Equations

Consolidating Reports

Calculating a Sales Commission

Changing Coordinate Systems

Macro Absolute Record command

(Full Menus)

Records cell references in a macro as absolute references.

Initially, cell references in macros are recorded as absolute references. When you are recording absolute references, this command appears on the Macro menu as Relative Record, allowing you to change to relative reference recording. If you choose the Macro Relative Record command, the command changes to Macro Absolute Record. Choose Macro Absolute Record to go back to recording cell references as absolute references.

For information on macros, see *Microsoft Excel Functions and Macros.*

Macro Record command

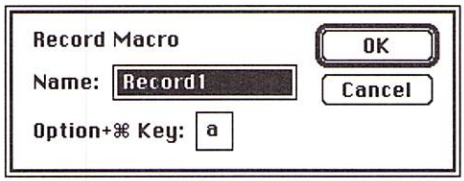
Records subsequent actions as a macro, so you can later repeat those actions by running the macro.

If no macro sheet is open, or if none of the open macro sheets has the recorder range set, Macro Record opens a new macro sheet and starts recording in cell A1. If a macro sheet is open and has the recorder range set, Macro Record starts recording in the recorder range if it is blank, or in the first blank column if the recorder range is not blank.

This command appears on the File menu as Record Macro if all documents are closed or hidden.

For information on macros, see *Microsoft Excel Functions and Macros.*

Before recording starts, a dialog box appears:



Name Type a short name that will remind you of what the macro does.

Key Type a shortcut key you can use to quickly run the macro later. The shortcut key can be any uppercase or lowercase letter; however, it cannot be a number.

While you are recording, the command changes to Stop Recorder. When you are finished recording your actions, choose Macro Stop Recorder.

All recording you do in one work session is recorded on the same macro sheet. If you are using short menus, you can't add a macro to a macro sheet you created in a previous work session. You have to use the Macro commands that appear only on full menus in order to specify where the recorder should start.

Macro Relative Record command

(Full Menus)

Records cell references in a macro as relative references.

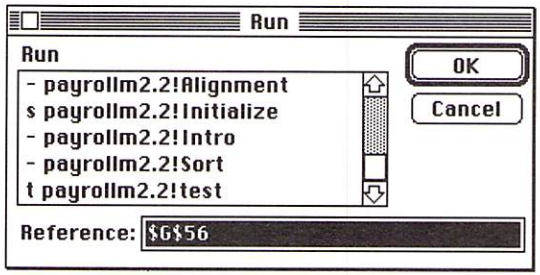
Initially, cell references in macros are recorded as absolute references. When you are recording relative references, this command appears on the Macro menu as Absolute Record, allowing you to change back to absolute reference recording.

For information on macros, see *Microsoft Excel Functions and Macros.*

Macro Run command

Runs a command macro from an open macro sheet.

For information on macros, see *Microsoft Excel Functions and Macros.*



Run Lists all named macros on all open macro sheets. Each macro name is preceded by the name of the macro sheet containing the macro and an exclamation point. Select the macro you want to run from this list box, or type the full name of the macro in the Reference text box.

Reference Displays the macro selected in the Run list box. You can also run a macro by typing the name or cell reference of the first cell of the macro in the Reference box.

If you type the macro name yourself, make sure you use the same format that Microsoft Excel uses in the Run list box.

Macro Set Recorder command

(Full Menus)

Defines the selection on your macro sheet as the recorder range. If the selection is a range of cells, that range becomes the recorder range. If the selection is a single cell, all the cells below that cell in the same column become the recorder range.

Use Macro Set Recorder when you want to start recording a macro on a specific macro sheet or part of a macro sheet.

Recording starts in the upper-left corner of the range and proceeds down the left column. At the bottom of each column within the selected range, recording is redirected to the cell at the top of the next column in the range with a GOTO function and continues down from there.

If the selection is a single blank cell, or the first cell in the recorder range is a blank cell, recording starts in that cell and continues down in the same column.

If the selection is a single, non-blank cell, or the first cell in the recorder range is a non-blank cell, recording starts at the end of the recorder range and continues downward. If the end of the recorder range contains a RETURN function, RETURN is overwritten. If the end of the range contains any other function, recording begins after that cell.

For information on macros, see *Microsoft Excel Functions and Macros.*

Macro sheet

A **macro sheet** is a worksheet that contains macros. Everything in a macro sheet works like a regular worksheet with the following exceptions:

- Worksheets normally display values, while macro sheets normally display formulas. For information on displaying formulas and values, see **Options Display command.**
- Macro sheets start with a wider column width to accommodate the formulas.
- When a macro sheet is the active document, the Formula Define Name dialog box has an extra set of options because there are different types of macros. For more information, see **Formula Define Name command.**

Macro Start Recorder command

(Full Menus)

Records subsequent actions and commands until you choose Macro Stop Recorder. The actions and commands are recorded as Microsoft Excel macro functions.

Before you start recording, you have to set the recorder range on your macro sheet with the Macro Set Recorder command, or by recording a macro with the Macro Record command. You cannot choose Macro Start Recorder until you set the recorder range. For more information, see **Macro Set Recorder command.**

While you are recording, Stop Recorder appears in place of Record on the Macro menu. When you choose Stop Recorder to stop recording, the command changes back to Record.

You can use Macro Start Recorder and Macro Stop Recorder to temporarily pause while recording a macro. You can also use them to add to an existing macro.

Initially, cell references are recorded as absolute references. References can also be recorded as relative references. For more information, see **Macro Absolute Record command** and **Macro Relative Record command.**

If Microsoft Excel encounters a non-blank cell, it stops recording and displays a message telling you that the recorder range is full.

For information on macros, see *Microsoft Excel Functions and Macros.*

Macro Stop Recorder command

(Full Menus)

Ends recording the macro you started with the Macro Record or Macro Start Recorder command.

Stop Recorder appears in place of Record on the Macro menu while you are recording a macro. When you choose Macro Stop Recorder to stop recording, the command changes back to Macro Record.

For information on macros, see *Microsoft Excel Functions and Macros.*

Memory management

When you open a document, Microsoft Excel keeps it in your computer's memory while you are using it. To get the best performance, use memory efficiently when you run Microsoft Excel, and make sure there is sufficient memory available to Microsoft Excel.

This topic explains:

- How Microsoft Excel uses memory
- Reducing amount of memory used
  Reducing memory used by Microsoft Excel
  Reducing memory used by other programs
- Increasing available memory
  Adding memory
  Using extra memory

How Microsoft Excel Uses Memory

When you start Microsoft Excel, your computer has a certain amount of free memory which Microsoft Excel can use to store the documents you are using. You can find out how much free memory you have by choosing About Excel from the Apple menu. The amount of free memory depends on:

- How much total memory your computer has
- How much memory your computer is using for desk accessory programs and network drivers
- How large the open documents are
- How many fonts are used by all open documents
- What other programs are running with Microsoft Excel
- How you have configured the Macintosh operating system

If you try to start Microsoft Excel when your computer doesn't have enough memory for the program to run adequately, a message is displayed and Microsoft Excel does not start.

Reducing Amount of Memory Used

You can reduce the amount of memory used by Microsoft Excel or by other programs.

Reducing Memory Used by Microsoft Excel

To save memory when using Microsoft Excel, you can:

- Reduce the number of documents open at one time.
  Closing documents as soon as you're finished with them frees the memory they occupied.
- Reduce the number of fonts used in your Microsoft Excel documents.
  Microsoft Excel keeps the fonts used by all open documents in memory. The fewer fonts used, the less memory is used.
- Break large worksheet models into small, linked worksheets.
  Large worksheets use a lot of memory and are hard to maintain. Breaking a worksheet into several smaller worksheets and linking those worksheets reduces the amount of memory you need.
  For example, suppose you use a large worksheet to process your income taxes. To break it down, you could use one worksheet for each schedule or form. You would usually need only one worksheet open at a time, and so you would use much less memory. For information on linking, see **Linking documents.**
- Avoid large blank areas between occupied columns of a worksheet.
  Microsoft Excel automatically reduces memory used by blank rows and columns at the beginning and end of a worksheet. However, blank columns in the middle of a worksheet use memory even though they contain no data.
- Convert repetitive worksheet formulas into array formulas.
  If several adjacent cells have equivalent formulas, you can often save memory by replacing their formulas with one array formula.
  For example, if the cells A1:A3 of a worksheet contain the formulas =B1*2, =B2*2, and =B3*2, you can enter the array formula =B1:B3*2 into the range A1:A3. Microsoft Excel keeps one array formula in memory, instead of the three formulas it would keep otherwise.

Note Formulas that return arrays must be entered as array formulas. To enter an array formula, press Command+Enter, or, with a mouse, press Command+Shift while you click the enter box in the formula bar. For information on entering array formulas, see **Array.**

Reducing Memory Used by Other Programs

To reduce the amount of memory used by other programs, you can:

- Avoid using "terminate-and-stay-resident" programs.
  Terminate-and-stay-resident programs are accessory programs that stay in memory, such as desktop accessory packages and keyboard macro packages. These programs can use large amounts of memory, and may interact unpredictably when Microsoft Excel operates within the MultiFinder environment.
- Avoid running other applications while running Microsoft Excel.
  If you are running Microsoft Excel under Apple's MultiFinder operating system, you can simultaneously run many other applications, such as word processors, communication programs, and so on. If you are using large documents or many documents in Microsoft Excel, you may want to avoid running other applications at the same time.

Increasing Available Memory

If you want to have more memory available to Microsoft Excel, you can add memory to your computer or use your computer's unused memory, if any.

Adding Memory

Microsoft Excel requires that your computer have 1 megabyte of basic memory. If your computer has less than 1 megabyte of basic memory, you need to add the necessary memory to run Microsoft Excel.

Using Extra Memory

You can expand Microsoft Excel's available memory to accommodate large documents or a larger number of active documents. For more information about increasing the amount of RAM reserved for Microsoft Excel, see *MultiFinder User's Guide* from Apple.

Related Information

Reference

For information on	See
Configuring your system	Hardware and system configuration

Sampler

Solving Simultaneous Equations

Menu and menu bar

The Microsoft Excel commands are listed on **menus** displayed along the **menu bar** at the top of the screen. The commands on a menu are grouped by function, and groups are separated by a line across the menu.

This topic explains:

- Short menus and full menus
- Menu bars in Microsoft Excel

This topic does not cover step-by-step procedures for displaying menus and choosing commands. For the basics of working with commands using the keyboard or the mouse, see **Command, menu, and dialog box.**

Short Menus and Full Menus

Microsoft Excel has two sets of command menus for working with worksheets, charts, and macro sheets:

- **Short menus** — display the most commonly used commands for routine worksheet, database, macro sheet, and chart tasks.
- **Full menus** — display all commands on short menus plus commands for more specialized or advanced tasks (for example, linking or special search-and-replace techniques).

The first time you start Microsoft Excel, short menus are displayed. To use a command on a full menu, you must display full menus.

To switch to full menus if you are in short menus:

▣ Choose Options Full Menus.

To switch to short menus if you are in full menus:

▣ Choose Options Short Menus.

For more information on short and full menus, see **Command, menu, and dialog box.**

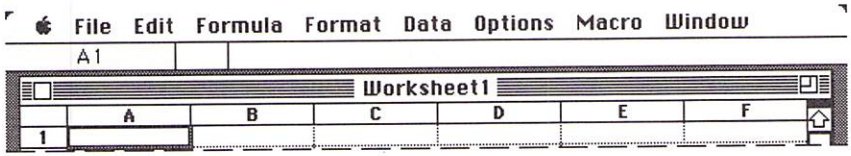
Note If you use Microsoft Excel to create applications for other users, you can create custom menus and dialog boxes for those applications. For more information, see Chapter 7, "Custom Menus and Dialog Boxes," in *Microsoft Excel Functions and Macros.*

Menu Bars in Microsoft Excel

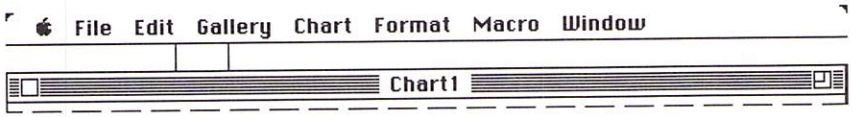
Menu bars are displayed across the top of the screen. A menu bar contains the names of all menus you can use while in the active window. Depending on which type of window is active, a different menu bar is displayed.

Here are the menu bars displayed by Microsoft Excel:

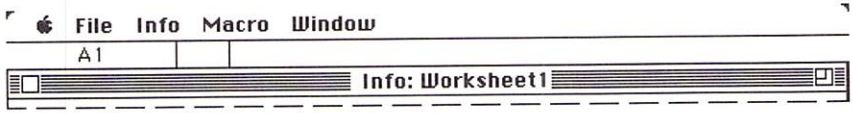
- **Worksheet menu bar** — displayed when a worksheet or macro sheet window is active:



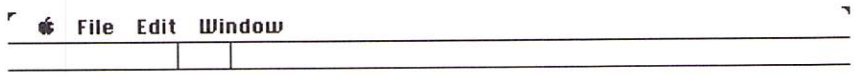
- **Chart menu bar** — displayed when a chart window is active:



- **Info menu bar** — displayed when an Info window is active:



- **Null menu bar** — displayed when no documents are open or active:



For information on the basics of working in each type of window, see **Worksheet**, **Chart**, and **Info window.** For information on macros, see *Microsoft Excel Functions and Macros.*

Related Information

Reference

For information on	See
Working with windows	Windows
Screen formats that enhance document display or simplify working with large documents	Color Display options
Commands and dialog boxes	Command, menu, and dialog box

Functions and Macros

Chapter 7, "Custom Menus and Dialog Boxes"

Microsoft Excel for Windows

Microsoft Excel for the Macintosh version 2.2 can exchange worksheets, macro sheets, and charts with Microsoft Excel for Windows. Both versions of Microsoft Excel use a common file format for saving files when you choose the Normal file format in the File Save and File Save As dialog boxes.

Related Information

Reference

For information on	See
Opening documents	Opening a document
Saving documents	Saving and closing a document
Managing directories	Folders

Microsoft Excel version 1.5

This topic presents the differences between Microsoft Excel version 2.2 and the previous version of Microsoft Excel.

This topic explains:

- New features

  File formats
  Fonts
  Memory management
  Date systems

- Using version 1.5 files with version 2.2

  Converting file formats
  Converting fonts

- Using version 2.2 files with version 1.5

  Converting file formats
  Converting fonts

- New and changed commands

  New commands
  Changed commands

Note This topic discusses only version 1.5 of Microsoft Excel. If you are using a version prior to version 1.5, you should compare information in this section to the documentation for your particular version of Microsoft Excel.

New Features

Some of the new features of Microsoft Excel version 2.2 affect its compatibility with Microsoft Excel version 1.5. These new features are:

- File formats
- Fonts
- Memory management
- Date systems

File Formats

Microsoft Excel 2.2 uses a new file format, called the Binary Interchange File Format. This new file format is the same format used with Microsoft Excel for Windows. So now files you create with Microsoft Excel version 2.2 can be used without modification in Microsoft Excel for Windows and Microsoft Excel for OS/2.

To learn how to use version 1.5 files with Microsoft Excel version 2.2, see "Using Version 1.5 Files with Version 2.2," later in this topic. For more information on file formats, see **Features and specifications.**

Fonts

Microsoft Excel version 2.2 supports 256 fonts on a single worksheet, while version 1.5 of Microsoft Excel supports only one font in four different styles: plain, bold, italic, and bold italic. This gives you greater formatting possibilities for presenting data. When you use version 2.2 files in version 1.5, all text is displayed in the single font, although all formatting is retained when you use the file in version 2.2 again. For more information about font conversion between version 2.2 and version 1.5, see "Using Version 1.5 Files with Version 2.2," later in this topic. For more information on fonts, see **Font.**

Memory Management

Version 2.2 of Microsoft Excel now lets you create worksheets as large as the memory available in your computer. Version 2.2 also supports a 4 megabyte heap space. Heap space is the area in random-access memory used to hold formulas and floating-point numbers.

The improved memory management in version 2.2 means that some files created using version 2.2 may be too large to load into version 1.5. If you run into this problem, try dividing the large worksheet into several smaller, linked worksheets. For more information on memory management, see **Memory management.** For more information on linking worksheets, see **Linking documents.**

If you are using MultiFinder, you can increase the amount of memory allocated to Microsoft Excel by using MultiFinder's File Get Info command. For more information, see your MultiFinder documentation.

Date Systems

Microsoft Excel version 2.2 uses the 1904 date system used in Microsoft Excel version 1.5.

However, with version 2.2 you can switch to the 1900 date system with the Options Calculation command. In the 1900 date system, the serial number 1 corresponds to January 1, 1900. This date system is provided for compatibility with Lotus 1-2-3 and Microsoft Excel for Windows. When trading files between other versions of Microsoft Excel and version 2.2, be sure you're using the date system you want and that your dates are accurate. For more information on dates, see **Date** and **Serial number.**

Using Version 1.5 Files with Version 2.2

This section explains how to use files created in version 1.5 with version 2.2, and how Microsoft Excel changes files to have them work with version 2.2.

Converting File Formats

1. Start Microsoft Excel version 2.2.
2. Choose the File Open command.
3. In the list box, select the file created with version 1.5 that you want to open.

   Microsoft Excel version 2.2 automatically opens the files in version 2.2 format.

Note Once you open and save a version 1.5 file with version 2.2, the only way to open it again with Microsoft Excel 1.5 is to save it in the SYLK format. Version 2.2 can open chart files created with version 1.5, but cannot save them in any format usable by version 1.5.

Converting Fonts

When used in version 2.2, files created in version 1.5 are converted to the standard font specified with the Options Standard Font command. Bold, italic, and bold italic styles are retained. For more information about the standard font, see **Font** and **Options Standard Font command.**

Using Version 2.2 Files with Version 1.5

This section explains how to use files created in version 2.2 with version 1.5, and how Microsoft Excel changes files to have them work with version 1.5.

Note If you are creating a document in version 2.2 that you know will be used in version 1.5, make sure the 1904 Date System check box in the Options Calculation command is turned on before you enter any data into the worksheet. For more information on date systems, see **Date.**

Converting File Formats

To use files created with or converted to the version 2.2 file format in version 1.5, you must first convert the files to SYLK file format. Chart files cannot be converted to SYLK format.

When version 2.2 documents are converted to SYLK format, the following changes are made:

- All adjusted row heights are displayed as standard height.
- All fonts are displayed in the single font of version 1.5.
- All cell shading is not displayed.
- All cell notes cannot be accessed.

1. Open the document in version 2.2 of Microsoft Excel.
2. Choose the File Save As command.
3. Type a name for the file in the Save Worksheet As box.
4. Click the Options button.
5. Click the SYLK/Excel 1.5 button.
6. Click the OK button.
7. Click the Save button.

Once you've converted version 2.2 files to the SYLK file format, you can start Microsoft Excel version 1.5 and open the documents.

1. Start Microsoft Excel 1.5.
2. Choose the File Open command.
3. In the list box, select the document you saved in the SYLK format.
4. To save the file in the Microsoft Excel 1.5 file format, choose the File Save As command.
5. Type a name for the file in the Save Worksheet As box.
6. Click the Normal button.
7. Click the Save button.

Converting Fonts

When converting version 2.2 files to SYLK file format for use in version 1.5, all fonts are displayed in the standard font used in Microsoft Excel version 1.5. Bold, italic, and bold italic styles are retained.

New and Changed Commands

This section briefly outlines the commands that are new or changed from version 1.5. This section explains command differences that may affect version 1.5 users.

New Commands

Many commands have been added in Microsoft Excel version 2.2. The following list names and briefly describes these commands:

New command	Purpose
Chart Add Overlay (Chart menus)	Adds an overlay chart to an existing chart
Chart Gridlines (Chart menus)	Add major and minor gridlines to chart axes
Chart Protect Document (Chart menus)	Protect a chart from changes
Data Form	Creates a form for entering or locating data in a database
Data Parse	Distributes a string of data into several cells
Edit Fill Left	Copies a cell's contents into cells to the left of it (to use this command, hold down Shift while selecting the Edit menu)
Edit Fill Up	Copies a cell's contents into cells above it (to use this command, hold down Shift while selecting the Edit menu)
Edit Paste Link	Pastes a link to copied data into the worksheet
Edit Repeat	Repeats your last command
File Open Mail	Reads Microsoft Excel documents sent to you through Microsoft Mail

New command	Purpose
Chart Full Menus (Chart menus)	Displays all commands on menus
Chart Short Menus	Displays basic commands on menus
File Save Workspace	Saves a list of open documents and windows
File Send Mail	Send Microsoft Excel documents to other users of Microsoft Mail
Format Font	Formats text in a variety of font styles and types
Format Justify	Aligns text within a range
Format Move (Chart menus)	Moves unattached items in a chart window using the keyboard
Format Row Height	Changes the height of a row or rows
Format Size (Chart menus)	Sizes unattached items in a chart window using the keyboard
Formula Notes	Attaches notes to individual cells
Formula Replace	Searches for and replaces text or numbers in cells and notes
Options Full Menus	Displays all commands on menus
Options Short Menus (Chart menus)	Displays basic commands on menus
Options Standard Font	Sets and changes the standard font for a worksheet
Options Workspace	Sets options for Microsoft Excel session
Window Arrange All	Arranges all the windows in the workspace
Window Help	Provides online help for Microsoft Excel — formerly under the About Excel command on the Apple menu
Window Hide	Hides a window
Window Show Info	Displays information about individual cells
Window Unhide	Displays a hidden window

For more information on these new commands, see the appropriate command topic. For example, to learn more about the Window Arrange All command, see **Window Arrange All command.**

Changed Commands

Some commands have been changed for Microsoft Excel version 2.2. The following list describes these commands and the changes to them:

Changed Command	Change from version 1.5
About Excel (Apple Menu)	Now has only information about Microsoft Excel and available memory (Help is on the Window menu)
Chart Main Chart Type (Chart menus)	Now part of Format Main Chart command
Chart Overlay Chart Type (Chart menus)	Now part of Format Overlay Chart Add Overlay command
Chart Set Preferred Format (Chart menus)	Now called Gallery Set Preferred command
File Close All	Now called File Close command — to display File Close All, hold down the Shift key while selecting the File menu
File Printer Setup	Now use the Chooser to select a printer
Format Axis (Chart menus)	Now called Format Scale command
Format Border	Now includes shading format
Format Style	Now part of Format Font
Gallery Combination	Now contains five chart types
Gallery Line	Now contains eight chart types
Options Display	Now lets you specify whether zero values are displayed
Options Font	Now called Options Standard Font command — sets the standard font for the worksheet
Options Precision as Displayed	Now part of Options Calculation command
Options Protect Document	Now can specify entire window or contents thereof
Options R1C1	Now part of Options Workspace command

For more information about these changed commands, see the appropriate command topic. For example, to learn more about the Window Help command, see **Window Help command.**

Related Information

Reference

For information on	See
Using Microsoft Excel documents with other applications	Exchanging data between applications

Microsoft Mail

You can use Microsoft Mail to send Microsoft Excel worksheets, charts, and macro sheets to other Microsoft Mail users. You can also open Microsoft Excel documents sent to you through Microsoft Mail from within Microsoft Excel.

This topic explains:

- Opening mail
- Sending mail

You can use Microsoft Mail from Microsoft Excel only if your Macintosh is connected to a Microsoft Mail server and you are signed in to your mailbox. This topic assumes you know how to use Microsoft Mail to read and send messages. For details about installing, signing in to, and using the mail system, see your Microsoft Mail manual.

Note To use Microsoft Mail with Microsoft Excel, you must have Microsoft Mail version 2.0 or later.

Opening Mail

Using the File Open Mail command, you can open Microsoft Excel documents sent to you by other users. The File Open Mail command lists the Microsoft Excel documents sent to you — not any other messages sent to you through Microsoft Mail.

To open mail messages:

1. Choose the File Open Mail command.
   To see just the message attached to the Microsoft Excel document, click the Info button.
2. Select the name of the message you want to open.
   To select multiple messages, hold down the Shift key while clicking or dragging through message names.
3. Click the Open button.
   Microsoft Excel automatically opens the file attached to the message and displays the message in a separate window. If you selected more than one message, each message is opened in a separate worksheet.
4. Click the close box.

For more information about mail commands, see your Microsoft Mail documentation.

Sending Mail

You can send any Microsoft Excel document through Microsoft Mail to other Microsoft Mail users. You create and format your worksheet, chart, or macro sheet as you normally would within Microsoft Excel, and then send it to other users. All the settings and formats of each Microsoft Excel document are sent along with the document.

To send a Microsoft Excel document to another Microsoft Mail user:

1. Choose the File Send Mail command.
   The Send Mail dialog box appears. Microsoft Excel automatically specifies the active document as the file to send along with the mail message. The subject line of the message contains the name of the current active Microsoft Excel document.
2. Specify the user(s) you want to receive your message.
3. Click the Close button.
4. To send your message, click the Send button.
   To erase your message without sending it, click the close box.

Related Information

Reference

For information on	See
Other ways to exchange data between users	Exchanging data between applications

Mixed reference

A **mixed reference** is a reference that uses an absolute column reference and a relative row reference, or vice versa. You can change an absolute reference or relative reference to a mixed reference by selecting the reference in the formula bar and choosing the Formula Reference command. For more information, see **References.**

Moving data on a worksheet

Moving data in a cell or range transfers the contents and any formats or notes attached to the cell or range. You can move data within a worksheet and between worksheets.

This topic explains:

- Moving data, formats, and notes in a worksheet

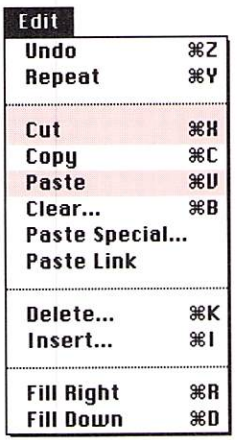
  How moving data affects references

  Moving data in cells and ranges

Note All concepts and procedures for moving data in worksheets also apply to macro sheets.

Moving Data, Formats, and Notes in a Worksheet

The commands for moving data in cells and ranges in a worksheet are on the Edit menu (full menu shown):



- Use Edit Cut to define the **cut area**, the cell or range containing the data you want to move.
- Use Edit Paste to place the cell or range containing the data you cut into the **paste area**, which is the new location you specify.

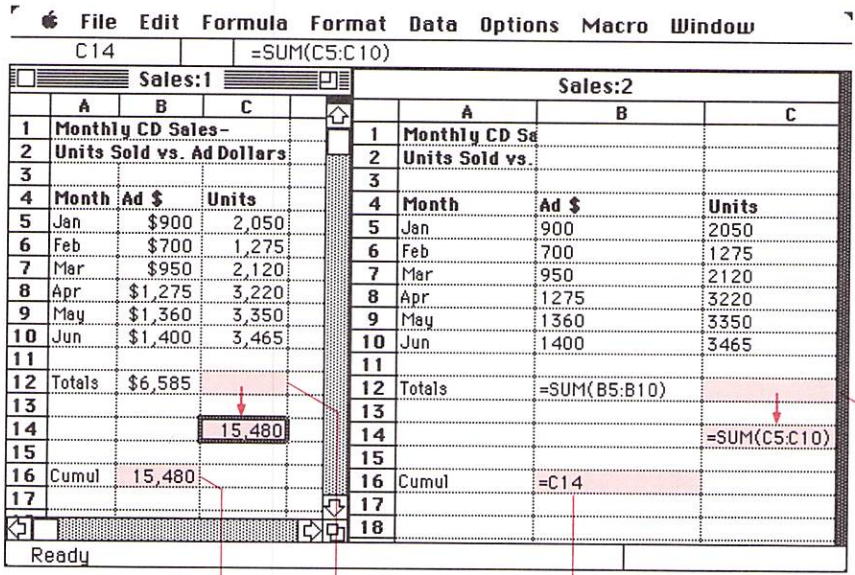
For information about each command, see **Edit Cut command** and **Edit Paste command.**

How Moving Data Affects References

Moving data is like physically cutting out the cells and pasting them into a new location — either in the same worksheet or in a different worksheet. Moving data has the following effects on references:

- Microsoft Excel automatically adjusts references to the moved cells. When you move the cells to the new location (the paste area), the references designate the same cells as they did before the cut; the formulas still calculate from the same values.
- Inside the cut area, Microsoft Excel does not change references to cells outside the cut area. After you move data, references in the paste area designate the same cells as they did in the cut area (see the illustration later in this section).
- Cells referring to the paste area (as it exists before you paste the moved cells) produce the error value #REF! since you are essentially "deleting" the area by pasting the moved cells over it.
- Outside the cut area, references to the cut area produce the error value #REF! if you move the cut cells to another worksheet.

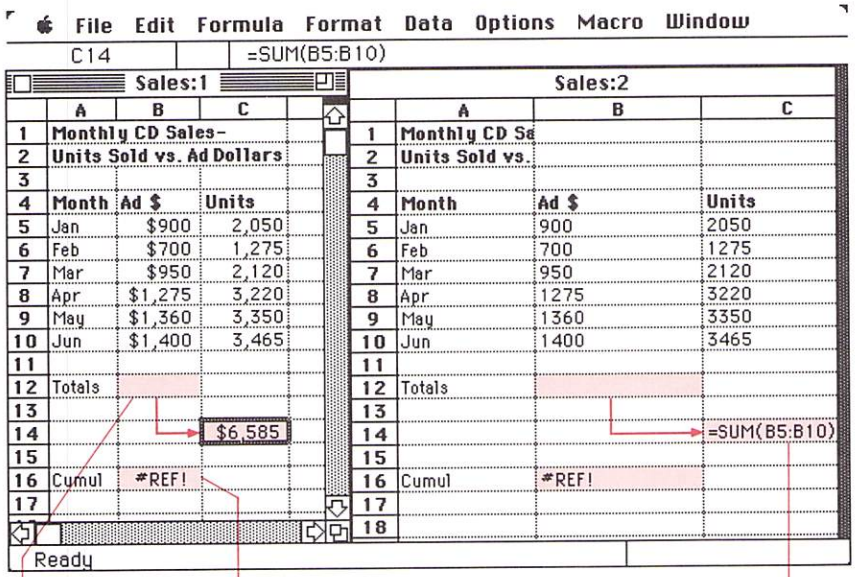
For example, the next two illustrations show two windows into the same worksheet — one window displaying values and one displaying formulas. In the following illustration, cell C12 is moved to cell C14. Notice that references within the cut area (cell C12) don't change when the cell is moved, but that Microsoft Excel does adjust references (cell B16) to the moved cell.


File Edit Formula Format Data Options Macro Window
C14
=SUM(C5:C10)
Sales:1
Sales:2
Ready
Before the move, cell B16 referred to cell C12.
Before the move, moved cell (C12) referred to cells C5:C10.
In cell B16, Microsoft Excel adjusts reference to the moved cell.
Moved cell still refers to the same cells as before the move.

	A	B	C
1	Monthly CD Sales-		
2	Units Sold vs. Ad Dollars		
3			
4	Month	Ad $	Units
5	Jan	$900	2,050
6	Feb	$700	1,275
7	Mar	$950	2,120
8	Apr	$1,275	3,220
9	May	$1,360	3,350
10	Jun	$1,400	3,465
11			
12	Totals	$6,585	
13			
14			15,480
15			
16	Cumul	15,480	
17			

	A	B	C
1	Monthly CD Sa		
2	Units Sold vs.		
3			
4	Month	Ad $	Units
5	Jan	900	2050
6	Feb	700	1275
7	Mar	950	2120
8	Apr	1275	3220
9	May	1360	3350
10	Jun	1400	3465
11			
12	Totals	=SUM(B5:B10)	
13			
14			=SUM(C5:C10)
15			
16	Cumul	=C14	
17			
18			

Now look at what happens if cell B12 is moved and pasted over cell C14:



Before the move, moved cell (B12) referred to cells B5:B10.

Before the move, cell B16 referred to cell C14 (total units sold).

After the move, cell B16 shows an error value because the cell it originally referred to was pasted over (and so deleted).

Moved cell still refers to same cells as before.

If you run into problems while moving cells, you can immediately choose the Edit Undo Paste command to restore the worksheet as it was before the move. This also restores error values such as #REF! to their original references.

Moving Data in Cells and Ranges

The easiest way to paste moved cells into the paste area is to select only the cell in the upper-left corner of the paste area. This way you can avoid accidentally specifying a differently shaped paste area, which produces an error. Just make sure the pasted cells will not replace other data you want to keep.

1. Select the cell or range containing the data you want to move.
2. Choose Edit Cut.
   Microsoft Excel surrounds the selection with a dotted line called a **marquee.**
3. Select the paste area, the cells you want to move the data to.
   If you are moving the data to another worksheet, activate that worksheet, then select the paste area.
4. Choose Edit Paste.

You can also overlap the cut area and paste areas.

Related Information

Reference

For information on	See
Moving information between applications	Exchanging data between applications
Copying information in worksheets and charts	Copying data and formats
References	References

Multiple selection

A **multiple selection** is a selection of cells that includes more than one single range of cells. You can make a multiple selection by holding down the Command key and selecting with the mouse. For more information, see **Selection** and **Keyboard.**

Names

A **name** is an easy-to-remember identifier you create as a reference to a cell, a group of cells, a constant value, or a formula. Using names in a formula — for example, =Assets−Liabilities — makes the formula easier to read and remember than using cell references for the formula — for example, =F6−D6.

By using names in formulas on a worksheet, you can also save time later if you need to change the value in the named cell. All formulas using that name are automatically updated.

This topic explains:

- Basic information and procedures

  Guidelines for defining a name
  Naming a cell or range
  Naming a value or formula
  Creating several names at one time
  Editing and deleting names

- Using names

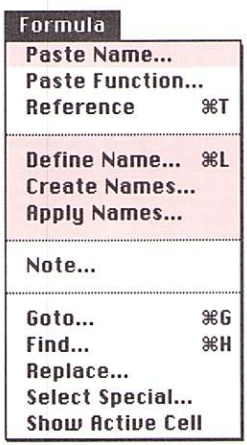
  Pasting a name
  Naming relative references

- Replacing references with names

  Applying names
  How names are applied

Basic Information and Procedures

The main commands for defining and using names are on the Formula menu (full menu shown):



- Use Formula Paste Name to remember what names you've defined and to paste them into the formula bar.
- Use Formula Define Name to define a single name.
- Use Formula Create Names to quickly create names for several rows or columns using text in the selected range.
- Use Formula Apply Names to search through a selected range and replace all references to a cell or range with the name you've defined for that cell or range.

Guidelines for Defining a Name

Follow these guidelines for defining a name:

- **Valid characters** — The first character must be a letter. Other characters can be letters, numbers, periods, and underlines. The name cannot look like a reference (such as A$1 or R1C1).
- **Separators** — Spaces are not allowed. Use an underline (_) or a period (.) as a word separator.
- **Length of name** — The name can be up to 255 characters long.
- **Capitalization** — You can use uppercase or lowercase letters. Microsoft Excel ignores the difference between uppercase and lowercase letters when dealing with names.

Naming a Cell or Range

Most often, you create a name to refer to a cell or group of cells. When you choose the Formula Define Name command, Microsoft Excel assumes you are naming cells and may propose a name from any text in the active cell or in the cell above or to the left of the active cell. It also proposes the absolute reference of the current selection.

1. Select the cell, cell range, or multiple selection you want to name.
2. Choose Formula Define Name.
3. In the Name box, type a name or accept the proposed name.
4. In the Refers To box, type the cell reference or accept the proposed reference.

   If you type a different reference in the Refers To box, it must begin with an equal sign (=).
5. Click the OK button.

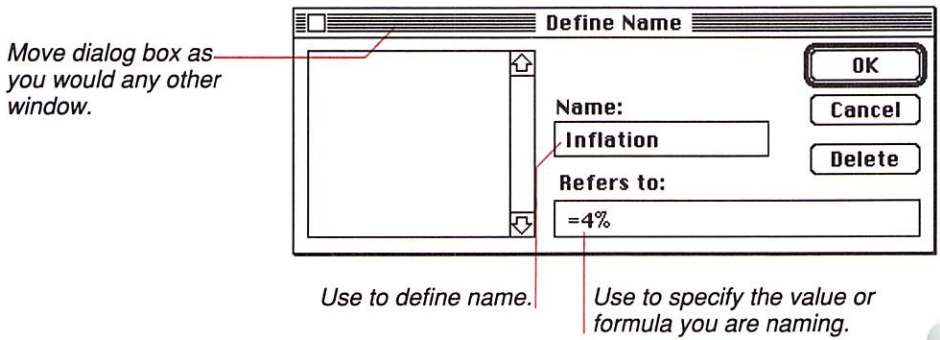
Microsoft Excel adds the name to its list of names for the worksheet.

Tip Use names for cells or ranges in a worksheet that you update or print often. To move quickly to the named cell or range, specify it with the Formula Goto command. For more information, see **Finding cells and data quickly.**

Naming a Value or Formula

In Microsoft Excel, you can name a value or formula without putting that value or formula in a cell. For example, you can specify that the name Inflation equals 4%, rather than have Inflation refer to the contents of a particular cell. This allows you to avoid cluttering your worksheet with such values, and also makes it easier to find and change the value. If you define a name as a value or formula, you can include that name in other formulas in the worksheet just as you can with other names.

You specify the value or formula you want to name in the Refers To box in the Formula Define Name dialog box, as shown in the following illustration:



You edit a formula or value in the Refers To box the same way you edit a formula in the formula bar. When the Refers To box is active, you can scroll the worksheet and select cells. Microsoft Excel adds the references for you. If you need to select a cell that is covered by the dialog box, you can drag the title bar to move the dialog box.

Later, if you want to change the inflation rate, you change the definition of Inflation in the Define Name dialog box, and all formulas on the worksheet using the name Inflation are automatically updated when you calculate the worksheet.

1. Choose Formula Define Name.
2. In the Name box, type the name.
3. In the Refers To box, type the value or formula.
4. Click the OK button.

Creating Several Names at One Time (Full Menus)

You can use the Formula Create Names command to create names for columns or rows of data in a selected range. This command creates the names from text in cells in the top or bottom row of the selected range, the left or right column of the range, or any combination of the four.

1. Select the range of data to be named, including the text you want to use as names.

   Be sure the text you select contains only valid characters. For more information on valid characters, see "Guidelines for Defining a Name" earlier in this topic.
2. Choose Formula Create Names.
3. To name the columns using the text in the top row of the range, turn on the Top Row check box.

   To name the columns using the text in the bottom row of the range, turn on the Bottom Row check box.

   To name the rows using the text in the left column of the range, turn on the Left Column check box.

   To name the rows using the text in the right column of the range, turn on the Right Column check box.
4. Click the OK button.

Editing and Deleting Names

Microsoft Excel displays the names you have already defined in a list box in the Formula Define Name dialog box. If you select a name from the list, Microsoft Excel displays that name in the Name box and its reference in the Refers To box. You can then edit the name or the reference.

To delete a name:

1. Choose Formula Define Name.
2. In the list box, select the name you want to delete.
3. Click the Delete button.

Microsoft Excel deletes the name and leaves the dialog box on the screen so you can edit or delete other names. Click the Cancel button to close the dialog box.

Note Clicking the Cancel button does not cancel any deletions you have made; it just closes the dialog box.

Using Names

Pasting a Name

After you define a name, you can place that name in a formula by typing the name, or you can use the Formula Paste Name command.

1. In the formula bar, position the insertion point where you want to paste the name.
2. Choose Formula Paste Name.
3. In the list box, select the name you want to paste.
4. Click the OK button.

You can also refer to a name you defined on another worksheet. Type the name of the worksheet, an exclamation point (!), and the name defined on that worksheet. For example, you can type *EXPENSES!Salaries* to refer to a group of cells named Salaries on the EXPENSES worksheet. For information on referring to names on other worksheets, see **Linking documents.**

Naming Relative References

Usually, you want to define names that refer to cells as absolute references. The name then points to a specific region of cells on the worksheet, and does not change if you cut and copy data on the worksheet. This way you always know exactly what cells the name refers to.

When you build a formula in the Refers To box, Microsoft Excel adds absolute references. However, you can type a relative reference or change a reference to relative using the Formula Reference command. For example, suppose the active cell is B2 and you define the name Previous_Month to be the relative reference A2. Then, whenever you use the name Previous_Month in a formula, Microsoft Excel looks in the cell to the left of the cell containing the formula.

Although you can use relative references in defining a name, you should do so with caution, because the actual cell being referenced changes when a formula using the name is cut or copied.

For example, you have a formula in cell B6 that uses the relative reference B2. If you move the formula from B6 to D6, the formula now refers to the contents of D2, not B2. If you had used an absolute reference in the orginal formula, the moved formula would still refer to B2.

To verify which cell is being referenced, select the cell where the name is being used, choose Formula Define Name, and select the name being used from the list box.

Replacing References with Names

Using names consistently in a worksheet makes it easier to follow the structure of the worksheet. If you have a worksheet with few or no names, you may want to go through the worksheet and change cell references to names.

Applying Names
(Full Menus)

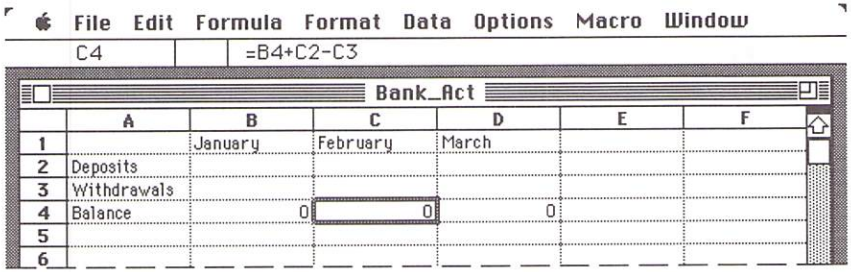
Once you have defined a name, use the Formula Apply Names command to scan all or part of a worksheet and replace equivalent references with the name. For example, if you define the name Sales as =$C$12, the Formula Apply Names command replaces all occurrences of C12 in formulas with the name Sales.

1. Select the range in which you want references replaced with names. To apply names to the entire worksheet, select a single cell.
2. Choose Formula Apply Names.
3. In the list box, select one or more names to be applied.
   Microsoft Excel initially selects the last name or names you defined.
   You can select more than one name by holding down the Command key and clicking the names you want to select.
4. If necessary, change the options.
   To help you decide if you want to change any of the options, see the following section for a description of how names are applied.
5. Click the OK button.

Microsoft Excel applies the names to the worksheet according to the guidelines discussed in the following section.

How Names are Applied

The best way to understand how names are applied is to look at an example. The following illustration shows a worksheet detailing the activity of a bank account on a monthly basis. Cell C4 is used to show how names are applied:



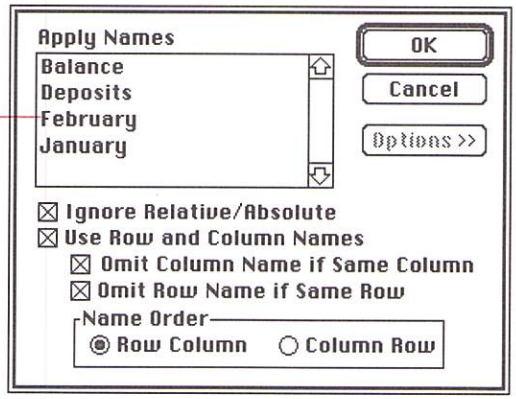
In this worksheet, the Formula Create Names command was used on the range A1:D4, with both Left Column and Top Row turned on. As a result, the following names were created:

Name	Refers to
Deposits	$B$2:$D$2
Withdrawals	$B$3:$D$3
Balance	$B$4:$D$4
January	$B$2:$B$4
February	$C$2:$C$4
March	$D$2:$D$4

The Deposits and Withdrawals rows contain constant numbers. The Balance row contains formulas that compute totals. For example, cell $C$4 contains the formula =B4+C2−C3.

When you choose Formula Apply Names, a dialog box appears. If you click the Options button in the dialog box, the full dialog box is displayed:

The list box lists the names defined for the worksheet Bank_Act.



The following table shows how names are applied in the example, depending on the settings in the dialog box:

Use Row and Column Names	Omit Column Names if Same Column	Omit Row Name if Same Row	Formula =B4+C2−C3
ON	ON	ON	=January+Deposits−Withdrawals
ON	ON	OFF	=Balance January+ Deposits−Withdrawals
ON	OFF	ON	=January+Deposits February− Withdrawals February
ON	OFF	OFF	=Balance January+Deposits February−Withdrawals February
OFF	ON or OFF	ON or OFF	=B4+C2−C3

When a cell reference is replaced by a column-oriented range name and a row-oriented range name, the two names appear in the formula one after the other, separated by a space, which is the intersection operator. If the reference is not within both a row-oriented and a column-oriented range, the reference is not replaced with a name.

Note If the reference is in a different row and column than the cell containing the reference, the reference is replaced with the name of both the row-oriented range and the column-oriented range containing the cell. When the reference is not in the same row or column, the two Omit Name options are irrelevant.

If the reference is in a different row and column than the cell containing the reference, and the reference does not lie within both a row-oriented named range and a column-oriented named range, the reference is left unchanged, because replacing it with only one name would produce an erroneous name.

Related Information

Reference

For information on	See
Entering and editing formulas	Formula Formula bar
Selecting cells on a worksheet	Keyboard
References	References

Sampler

Analyzing a Loan

Analyzing the Break-even Point

Solving Simultaneous Equations

Networks with Microsoft Excel

A **network** allows several computers that are connected electronically to share data. If your computer is linked with other computers on a network, you can all run Microsoft Excel from that network.

This topic explains:

- Running Microsoft Excel from a network

  Installing Microsoft Excel on a network

- Data access, data protection, and printing

  Accessing shared documents

  Protecting shared documents

  Using printers on a network

Running Microsoft Excel from a Network

The Microsoft Excel program files that are typically installed on your computer's hard disk can also be placed in a network file folder. You can then run Microsoft Excel on any workstation that has access to the network file folder. For information on restrictions on network use, see your Microsoft Excel license agreement.

Installing Microsoft Excel on a Network

Using Microsoft Excel on a network requires no special installation procedure. Simply copy the Microsoft Excel program, and associated files such as the Dialog Editor, to the file server.

Data Access, Data Protection, and Printing

Running Microsoft Excel from a network allows many users to share and print the same documents. When documents are shared on a network, there are several ways you can access and protect them.

Accessing Shared Documents

You can access a shared document on the network in the following ways:

- Open the document with "read-only" access. That means that you can open the document, but you can't edit it.
- Open the document with "read-write" access. That means that you can open the document and edit it. To prevent multiple users from making changes to the document at the same time, only one user at a time can open a document with read-write access.
- Create links between your personal Microsoft Excel document and a shared document on the network. You can create links between two or more Microsoft Excel documents. The links ensure that your personal documents are updated along with the shared documents. For information on linking, see **Linking documents.**

In a shared data environment such as a network, it's a good idea to open a document as read-only unless you need to edit the document.

To open a document with read-only access	To open a document with read-write access
1 Choose File Open.	1 Choose File Open.
2 Type the name of the document. If the document is in a folder other than the active one, select the proper folder.	2 Type the name of the document. If the document is in a folder other than the active one, select the proper folder.
3 Turn on the Read Only check box.	3 Turn off the Read Only check box.
4 Click the OK button.	4 Click the OK button.

Note If you try to open a document with read-write access while another user with read-write access is working on the document, Microsoft Excel displays a message indicating that the document is read-only. Clicking the OK button opens the document with read-only access; clicking the Cancel button cancels the command.

Protecting Shared Documents

The following table summarizes ways to use the Microsoft Excel data protection features when storing data on a network:

To store a document on the network	You can
And only allow authorized users to access it	Save the document with a password using the File Save As command. Give the password only to authorized users.
And prevent anyone from editing it	Lock all the cells in the document using the Format Cell Protection command. Protect the document with a password, using the Options Protect Document command.
And only allow authorized users to edit it	Lock all the cells in the document using the Format Cell Protection command. Protect the document with a password, using the Options Protect Document command. Give the password to anyone authorized to edit the document.

But hide part of that document from unauthorized users	Hide those cells using the Format Cell Protection command and set the column width or row height for the columns or rows containing the cells to zero. Protect the document with a password, using the Options Protect Document command. Give the password to anyone authorized to edit the document.

For more information on specific procedures for using the Microsoft Excel data protection options, see **Protecting or hiding data.**

Using Printers on a Network

Generally, the procedures for printing from a network are the same as regular printing procedures.

For information on printing and printer setup, see **Printing a document.**

Related Information

Reference

For information on	See
Startup procedures	Starting Microsoft Excel
Opening files	Opening a document
Copying or moving data between Microsoft Excel documents and between Microsoft Excel and other applications	Copying data and formats Moving data on a worksheet Exchanging data between applications
Saving files	Saving and closing a document
Ending a work session	Quitting Microsoft Excel
Data protection	Protecting or hiding data

Notes

A **note** is an annotation or comment attached to a particular cell in a worksheet or macro sheet. Notes are useful for documenting your data sources, explaining underlying assumptions of a worksheet model, or detailing the way a macro works. They can function as memory joggers for you and as quick reference aids for others who use your model. You can view all notes in a worksheet in sequence or print them — with or without the main document. By creating a series of notes to follow, you can map out online or printed "guided tours" of worksheet models or macros for others who use your documents.

This topic explains:

- Creating and deleting notes

  Creating a note
  Creating multiple notes quickly
  Deleting a note

- Using notes

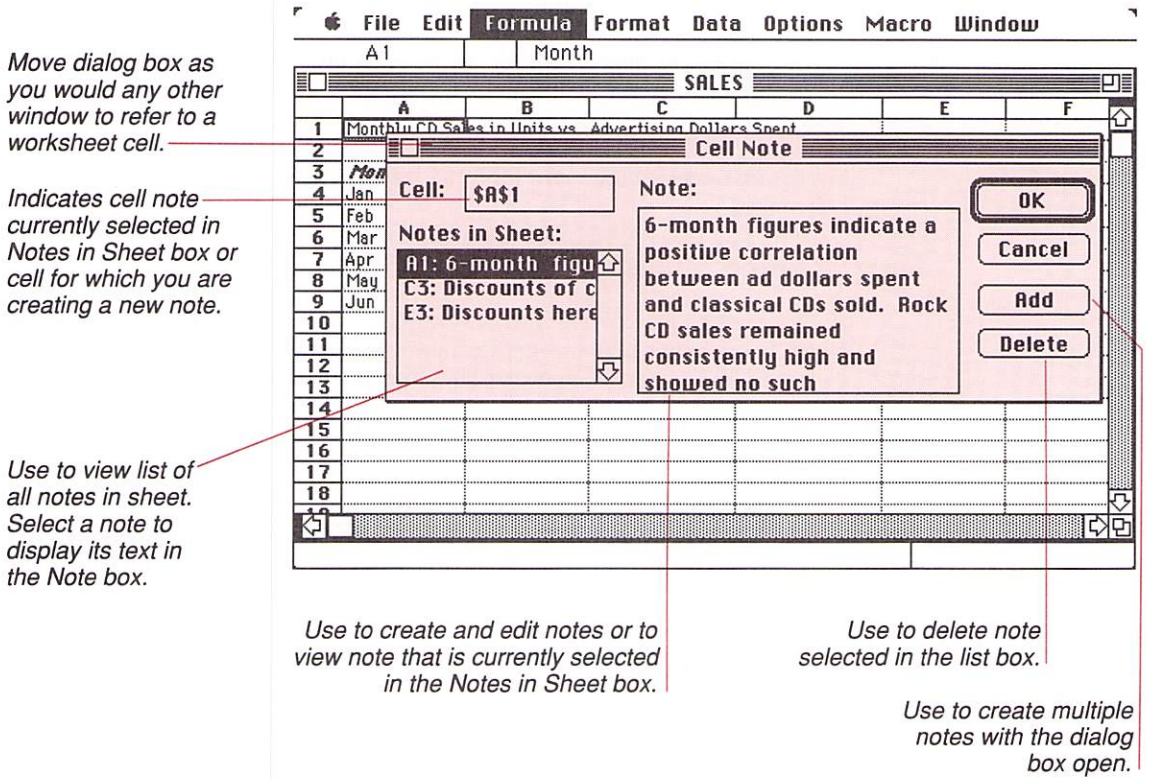
  Viewing notes
  Scrolling through notes in the Info window
  Printing notes

This topic does not discuss detailed procedures for using the Info window, from which you can also display and print cell notes. For more information, see **Info window.**

Note All cell note procedures for worksheets also apply to macro sheets.

Creating and Deleting Notes

You create notes in the Formula Note command dialog box. The following illustration shows the features of this dialog box.


Move dialog box as you would any other window to refer to a worksheet cell.
Indicates cell note currently selected in Notes in Sheet box or cell for which you are creating a new note.
Use to view list of all notes in sheet. Select a note to display its text in the Note box.
File Edit Formula Format Data Options Macro Window
A1
Month
SALES
Cell Note
Cell:
$A$1
Note:
Notes in Sheet:
A1: 6-month figu
C3: Discounts of c
E3: Discounts here
6-month figures indicate a positive correlation between ad dollars spent and classical CDs sold. Rock CD sales remained consistently high and showed no such
OK
Cancel
Add
Delete
Use to create and edit notes or to view note that is currently selected in the Notes in Sheet box.
Use to delete note selected in the list box.
Use to create multiple notes with the dialog box open.

To edit a note, use standard procedures for editing in the formula bar. For information on editing in the formula bar, see **Formula bar.**

Tip If a cell has a note attached to it, double-clicking that cell displays the Formula Note dialog box.

Creating a Note

1. Select the cell you want to annotate.
2. Choose Formula Note.

   The flashing insertion point means the Note box is the active area.
3. Type the text of the note in the Note box.

   Do not press Enter to insert a line break. The text you type automatically wraps to the next line. To insert a line or paragraph break, press Command + Return.
4. Click the OK button.

Microsoft Excel attaches the note to the cell, along with its cell reference.

Creating Multiple Notes Quickly

If you want to attach notes to several cells, you can leave the Formula Note dialog box open and create multiple notes at one time. When the Cell text box is active, you can click a cell or type the cell reference.

1. Select the first cell you want to annotate.
2. Choose Formula Note.
3. In the Note box, type the text of the note.

   Do not press Enter to insert a line break. The text you type automatically wraps to the next line. To insert a line or paragraph break, press Command + Return.
4. Click the Add button.

   Microsoft Excel attaches the note to the cell and lists the cell reference and first few words of the note in the Notes in Sheet box. Then it activates the Cell box and selects the cell reference.
5. Select the next cell you want to annotate, or type the reference in the Cell box.

   As soon as you select a new cell or start typing, the old cell reference is replaced by the new reference.
6. Click the Note box.

   Microsoft Excel activates the Note box and displays the text of the previous note.
7. To create the next note, edit the contents of the Note box.
8. Click the Add button.
9. Repeat steps 5–8 for each additional note you want to create.
10. When you are finished adding notes, click the Cancel button.

Deleting a Note

1. Choose Formula Note.
2. Select the note in the Notes in Sheet box.
3. Click the Delete button.
   Microsoft Excel displays a message asking you to confirm the deletion.
4. To confirm the deletion, click the OK button.
   To cancel the command and return to the Formula Note dialog box, click the Cancel button.
5. Repeat steps 2–4 for each note you want to delete.
6. When you are finished deleting notes, click the Cancel button to close the Formula Note dialog box.

Note Clicking the Cancel button in the Cell Note dialog box does not cancel any deletions you have made; it just closes the dialog box.

Using Notes

This section explains techniques for viewing and printing cell notes.

Viewing Notes

Use this procedure to view a particular note or to see a list of the notes in the worksheet.

1. Select any cell in the worksheet.
2. Choose Formula Note.
3. To see the list of notes, scroll through the Notes in Sheet box.
   To view a particular note, select it in the Notes in Sheet box. The Note box displays the text of the note.
4. When you are finished viewing the notes, click the Cancel button.

Scrolling Through Notes in the Info Window (Full Menus)

You can browse through notes for a worksheet or macro sheet by using the Info window. The Info window can display nine different kinds of detailed information about the active cell, including the note attached to the cell. With the Info window displayed, you can quickly scroll through all cell notes in a worksheet or in a range of the worksheet, using the Formula Select Special command.

1. Choose Window Show Info to display the Info window.
2. If the Info window is not set to display notes, choose Info Note.
3. Move and size the windows so that the worksheet and Info windows are both visible.

   The Window Arrange All command arranges the open windows so you can see all of them at once.
4. Activate the worksheet window.
5. To view notes in a certain range of the worksheet, select that range.

   To view all notes in the worksheet, select a single cell.
6. Choose Formula Select Special.
7. In the dialog box, click Notes.
8. Click the OK button.

   Microsoft Excel makes a multiple selection that includes all cells with notes attached to them.
9. Press Tab to move cell by cell through the selected cells and display the note for each in the Info window.

   Press Command+Tab to jump between ranges of the multiple selection.

For information on specifying data displayed in the Info window or turning off the display of data, see **Info window.**

Printing Notes

You can print cell notes with or without their accompanying worksheet. If you specify that both the worksheet and notes be printed, Microsoft Excel prints the worksheet first, followed by the notes.

1. Choose File Page Setup.
2. Select the options you want in the dialog box.
   To print notes with cell references before each note, turn on the Print Row and Column Headings check box. To print notes without cell references before each note, turn off the Print Row and Column Headings check box.
3. Click the OK button.
4. Choose File Print.
5. Select the options you want in the dialog box.
   To print only notes, click Notes under Print. To print the worksheet and its notes, click Both.
6. Click the OK button.

Note If you have previously specified a print area (a section of a worksheet you want to print), Microsoft Excel prints notes only for cells in the print area.

For information on the File Page Setup command dialog box options, see **File Page Setup command.** For information on printing options and procedures, see **Printing a document.**

Tip You can create Info window printouts for all cells in a worksheet or for selected cells only. An Info window printout can contain any or all of the types of data you display in the Info window for each cell: reference, formula, value, formats, protection status, names associated with the cell, precedents, dependents, and any note attached to the cell. For information on creating an Info window printout, see **Info window.**

Related Information

Reference

For information on	See
Using the Info window	Info window
Printing procedures	Printing a document
Using dialog boxes	Command, menu, and dialog box
Tracing relationships among cells; verifying range names	Auditing worksheet models

Sampler

Correcting for Instrument Drift

Solving Simultaneous Equations

Number

In Microsoft Excel, a number can be entered directly into a cell or can be produced as the result of a formula. A number entered directly into a cell is called a **constant number.**

This topic explains:

- Entering a number in a formula
- Entering a number in a cell
- How Microsoft Excel stores numbers
- Controlling the accuracy of numbers
- Using built-in number formats
- Creating your own number formats

  Number format requirements

  Creating a custom number format

- Definitions of number format symbols

Entering a Number in a Formula

Numbers can include any of the following characters:

1 2 3 4 5 6 7 8 9 0 − + . E e

When you enter a number in a formula, Microsoft Excel recognizes the following formats:

Integer	789, −789
Decimal fraction	7.89, 0.789, −.789
Scientific notation	7.89e1, 789E−12

If you enter a number in a format other than integer, decimal fraction, or scientific notation, Microsoft Excel interprets it as text, or as a date or time if the number is entered in a standard date or time format. For information on entering dates and times, see **Date** and **Time.**

Entering a Number in a Cell

When you enter a number as a constant in a cell, you can include the following characters along with one of the number formats:

( ) $ % ,

Microsoft Excel ignores plus signs (+) that come before numbers. To enter a negative number, either precede it by a minus sign (−) or enclose it within parentheses ( ). You can also include commas in numbers you enter as constants, such as 1,000,000.

When you create a new worksheet, all cells have General format. In General format, Microsoft Excel displays numbers as precisely as possible, using integer format (789), decimal fraction format (7.89), or scientific notation (7.89E+08) if the number is longer than will fit in the cell.

When you enter a number that contains a dollar sign ($) before the number, or a percent sign (%) after the number, Microsoft Excel automatically changes the cell's format from General format to dollar format or a percentage, respectively. If you use one of the built-in date or time formats when you enter a date or time, Microsoft Excel automatically changes the cell's format from General to the appropriate date or time format. For information on date and time formats, see **Date** and **Time.**

How Microsoft Excel Stores Numbers

Microsoft Excel stores numbers to 15 digits of accuracy. This is called **full precision.** The largest positive number you can use is 1.789E305, and the smallest number you can use is 2.225E−307. If you enter a number that does not fall within this range, Microsoft Excel stores the number as text.

Microsoft Excel displays a number according to the format of the cell containing it, so the number you see in a cell may differ from the number Microsoft Excel stores. In calculations, however, Microsoft Excel uses the number stored in the cell no matter how it is displayed on the screen.

If a number is too long to display within the width of the cell, Microsoft Excel displays all number signs (######) in the cell. If you widen the column enough, either by using the Format Column Width command or by dragging the column header with the mouse, Microsoft Excel displays the number in the cell's format. For more information, see **Column.**

Controlling the Accuracy of Numbers

Because a cell's displayed value and the stored value can be different (usually because a number is rounded off when displaying less than full precision), your formulas may sometimes produce results that appear to be wrong.

For example, you might have a worksheet where two cells have formulas that produce the value 2.006, and another cell has a formula that adds the two cells together for a total of 4.012. If the cells were formatted with dollar format, however, the results would appear to be $2.01 + $2.01 = $4.01 due to rounding. You can resolve this by storing numbers at less than full precision with the Precision As Displayed option in the Options Calculation dialog box.

If you use Precision As Displayed, the value stored in the cell and used in calculations is the same as the displayed value.

1. Choose Options Calculation.
2. Turn on the Precision As Displayed check box.
   Microsoft Excel displays a message warning you that the worksheet data will permanently lose accuracy as a result of this selection.
3. Click the OK button.

The next time your worksheet is calculated, the numbers stored in the cells are calculated with Precision As Displayed.

Note Calculating with Precision As Displayed may slow calculation, because it forces Microsoft Excel to round numbers as it calculates them.

Using Built-in Number Formats

You control how a number is displayed primarily with the number formats in the Format Number dialog box. You can use one of the built-in number formats or create your own custom number formats. Custom number formats are covered in the next section of this topic.

To use a built-in number format:

1. Select the cells you want to format.
2. Choose Format Number.
3. Select a format from the list.
4. Click the OK button.

Microsoft Excel assigns the number format to the selected cells.

The following table shows some examples of Microsoft Excel built-in number formats. You can use these built-in formats, or create your own. For more information, see **Formatting a document** and **Format Number command.**

	Number typed		
Format	**5**	**−5**	**.5**
General	5	−5	0.5
0	5	−5	1
0.00	5.00	−5.00	0.50
#,##0	5	−5	1
#,##0.00	5.00	−5.00	0.50
$#,##0 ;($#,##0)	$5	($5)	$1
$#,##0 ;[Red]($#,##0)	$ 5	($ 5)*	$ 1
$#,##0.00 ;($#,##0.00)	$5.00	($5.00)	$0.50
$#,##0.00 ;[Red]($#,##0.00)	$ 5.00	($5.00)*	$0.50
0%	500%	−500%	50%
0.00%	500.00%	−500.00%	50.00%
0.00E+00	5.00E+00	−5.00E+00	5.00E−01

*Will display red.

Note that the dollar formats produce trailing spaces for positive numbers.

Creating Your Own Number Formats

For each worksheet, you can create your own number formats to use in addition to Microsoft Excel number formats. Because you can create your own number formats, you can display numbers however you want and reduce data entry time.

Some examples of the custom number formats you can create are:

- Formats for social security numbers or telephone numbers. You enter just the numbers into the cells, and Microsoft Excel supplies the hyphens or other punctuation marks.
- Formats that use text. You enter just the numbers, and Microsoft Excel supplies the quantifiers such as "lbs." or "DM."
- A format that makes positive numbers blue, negative numbers red and in parentheses, zeros green, and text black.

Number Format Requirements

Microsoft Excel represents number formats with a "picture" that uses symbols to show how the numbers will appear in the formatted cells. Each picture consists of up to four sections separated by semicolons: three number sections and a text section. Each section represents the format to use for different kinds of values, as follows: positive number;negative number;zero;text.

You do not have to include all of the sections in your format. If there are three number sections in the picture, the first section is the format used for a positive number, the second section is the format used for a negative number, and the third section is the format used for zeros. If there are two sections, the first one is used for positive numbers and zeros, and the second one for negative numbers. With one section, all numbers use the format in that section.

For each part of the picture, you type symbols that represent how you want the number to look. The symbols are listed later in this section.

If you create your own number formats, you can also add a text formatting section. A text format, if included, is always the last in the list. Type an @ symbol in the text format section to identify it as the text format. The @ symbol is also the placeholder for text you type into the cell. For example, if the number format for the active cell is:

#.0;(#.0);0.0;"See comment" @

and you enter "A" in the cell, the cell will display: See comment A

If you have a text section, it changes how Microsoft Excel applies the number sections. For example, a picture format with three sections, the last of which is not a text format, is interpreted as "format if positive; format if negative; format if zero." If a picture format has three sections, and the last section is a text format (contains an @ symbol), Microsoft Excel interprets it as "format if positive or zero; format if negative; format if text."

To set the color for a section of the format, just type a color indicator in that section.

If you have semicolons with nothing between them, the missing section prevents that type of number from being displayed. For example, you could create a picture format like the following:

format if positive;;;format if text

Because this number format does not define how to display negative numbers (the second section) or zeros (the third section), any cells with this format will appear blank if they contain a negative number or zero.

Creating a Custom Number Format

1. Select the cells you want to format.
2. Choose Format Number.
3. Select a number format, edit it in the Format box, or type a new format in the Format box.
4. Click the OK button.

Microsoft Excel formats the cells with the new format and adds the format to the list box so you can use it for other cells whenever you want. If you edited an existing format, Microsoft Excel adds the new format to the list box without destroying the format you changed. The only way to lose a number format is to delete it with the Delete button. You cannot delete any of the built-in number formats.

Here are some examples of number formats you can create:

With this format	This number	Is displayed this way
#.##	1234.568 0.1	1234.57 .1
#.0#	1234.458 12	1234.46 12.0
#,##0"CR"; #,##0"DR";0	1234.568 −12.34 0	1235CR 12DR 0
#,	12000	12
"X="0.0	1234.568 −12.34	X=1234.6 −X=12.3

With this format	This number	Is displayed this way
"X="0.0;"X="−0.0	−12.34	X=−12.3
$* #,##0.00; $* −#,##0.00	1234.568 −12.34	$ 1,234.57 $ −12.34
000-00-0000	435690891	435-69-0891
"Acct No." 0000	8967	Acct. No. 8967
0;−0;	0	NOT DISPLAYED
;;	Any number	NOT DISPLAYED
"Number"	Any number	Number

Definitions of Number Format Symbols

Each format symbol has its own meaning. Microsoft Excel uses these symbols in its built-in formats. You can also use these symbols to create your own formats.

This symbol	Means this
General	Display the number in General format.
0	Digit placeholder. If the number has fewer digits on either side of the decimal point than there are zeros on either side of the decimal point in the format, then Microsoft Excel displays the extra zeros. If the number has more digits to the right of the decimal point than there are zeros to the right in the format, Microsoft Excel rounds the number to as many decimal places as there are zeros to the right. If the number has more digits to the left of the decimal point than there are zeros to the left in the format, Microsoft Excel displays the extra digits.
#	Digit placeholder. Follows the same rules as for 0 above, except that Microsoft Excel does not display the extra zeros if the number has fewer digits on either side of the decimal point than there are #'s on either side in the format.

This symbol	Means this
.	Decimal point. This symbol determines how many digits (0's or #'s) Microsoft Excel displays to the right and left of the decimal point. If the format contains only #'s to the left of this symbol, Microsoft Excel begins numbers smaller than 1 with a decimal point. To avoid this, you should use 0 as the first digit placeholder to the left of a decimal point instead of #.
%	Percentage. Microsoft Excel multiplies by 100 and adds the % character.
,	Thousands separator. Microsoft Excel separates thousands by commas if the format contains a comma surrounded by #'s or 0's. You can place two commas in a row, or a comma followed by a period, to scale financial figures by a thousand, a million, etc.
E− E+ e− e+	Scientific format. If a format contains one 0 or # to the right of an E−, E+, e−, or e+, Microsoft Excel displays the number in scientific format and inserts an E or e. The number of 0's or #'s to the right determines the number of digits in the exponent. Use E− or e− to place a minus sign by negative exponents. Use E+ or e+ to place a minus sign by negative exponents and a plus sign by positive exponents.
$ − + ( ) Space	Display that character. To display a character other than one of these, precede the character(s) with a backslash ( ) or enclose the character(s) in double quotation marks (" ").
	Display the next character in the format. Microsoft Excel does not display the backslash. This is the same as enclosing the next character in double quotation marks.
*	Repeat the next character in the format enough times to fill the column width. You cannot have more than one asterisk in one section of a format. Use this to insert space characters between a $ symbol and a currency figure so that the $ symbol is pushed to the left edge of the cell.

This symbol	Means this
"Text"	Display whatever text is inside the double quotation marks.
@	Text placeholder. If the cell contains text instead of a number, the text is inserted in place of the @ character in the text section of the number format and the text format is used to display the cell contents.
[Black]	Changes the color of the characters displayed in the cell to black.
[Blue]	Changes the color of the characters displayed in the cell to blue.
[Cyan]	Changes the color of the characters displayed in the cell to cyan.
[Green]	Changes the color of the characters displayed in the cell to green.
[Magenta]	Changes the color of the characters displayed in the cell to magenta.
[Red]	Changes the color of the characters displayed in the cell to red.
[White]	Changes the color of the characters displayed in the cell to white.
[Yellow]	Changes the color of the characters displayed in the cell to yellow.

Related Information

Reference

For information on	See
Constant numbers	Constant value
Entering and editing formulas	Formula Formula bar
Formatting numbers	Formatting a document
Calculations in Microsoft Excel	Calculation

Sampler

Changing Coordinate Systems

One-input table

A **one-input table** consists of:

- One group of values that are substituted for a single variable in one or more formulas.
- The formula results that occur when the values are substituted for the variable.

Data tables are useful for "what-if" analysis. For more information, see **Data table.**

Opening a document

This topic explains the various procedures for opening a document, including:

- Creating a new document
- Opening an existing document

Note This topic does not discuss workspace files or opening linked documents. For information on opening a workspace file, see **Workspace file.** For information on opening linked documents, see **Linking documents.**

Creating a New Document

1. Choose File New.
2. Select the type of document you want to create: Worksheet, Chart, or Macro Sheet.
3. Click the OK button.

Microsoft Excel shows the new document in a new window, with its upper-left corner in the upper-left of the workspace. If a window already occupies that area, Microsoft Excel places the new document window slightly lower and to the right.

Microsoft Excel gives the new document a temporary name, such as Worksheet1 or Chart1. When you create more than one new document of the same kind during a session, Microsoft Excel numbers them sequentially (Worksheet2, Worksheet3, and so on). You name each new document when you save it using the File Save As command.

Until you change a document's settings, the Microsoft Excel default settings apply to the new document. When you save the document, Microsoft Excel stores any setting changes along with the document. Your settings override the defaults whenever you reopen and activate the document.

For information on the Microsoft Excel default settings, see **Default settings.** For information on saving a new document, see **Saving and closing a document.**

Opening an Existing Document

Once you've saved a document with a particular name, use that name whenever you want to open the document. For example, if you want to open a chart that you've saved with the name ASSETS, choose the File Open command and select ASSETS in the dialog box. Microsoft Excel looks in the current drive and folder for the document named ASSETS.

To open an existing document in the current drive and folder:

1. Choose File Open.
2. In the list box, select the name of the document you want to open.
   If the document you want is not in the current folder and drive, select the proper drive and folder before trying to open the document. For more information on folders, see **Folders.**
3. Click the OK button.

Related Information

Reference

For information on	See
Procedures for starting or quitting Microsoft Excel	Starting Microsoft Excel Quitting Microsoft Excel

Operator

An **operator** is an instruction, such as a plus sign (+) or a minus sign (−), in a formula that tells Microsoft Excel to produce a new value from existing values. Operators act on **operands.** For example, in the formula =5+2, the plus sign (+) is the operator that instructs Microsoft Excel to add the operands 5 and 2 and produce the value 7.

This topic explains:

- Operator basics
- Arithmetic operators
- Text operator
- Comparison operators
- Reference operators
- Order of operations

Operator Basics

Microsoft Excel has four types of operators:

- Arithmetic
- Text
- Comparison
- Reference

Some operators act on two operands; others act on one. The formula =5+2 uses two operands. In the formula =3%, the percentage operator divides the operand (3) by 100 to produce the value 0.03.

Operands should be single values, references to single cells, or names that refer to single cells or constant values. In a formula, if you specify a reference to a row or column of cells that should be a reference to a single cell, Microsoft Excel chooses just one cell from that reference on which to perform the operation or function. If the reference is a row, Microsoft Excel chooses the cell that is in the same column as the cell containing the formula; if the reference is a column, Microsoft Excel chooses the cell that is in the same row as the cell containing the formula. For example, if you enter the formula =A1:J1−A2:J2 in C3, Microsoft Excel subtracts C2 from C1.

Arithmetic Operators

The arithmetic operators perform basic mathematical operations. They combine numeric values and produce numeric results. The arithmetic operators are:

+	Addition
–	Subtraction
–	Negation (if used with one operand only)
*	Multiplication
/	Division
%	Percentage
^	Exponentiation

Text Operator

The ampersand (&) is the text operator. It joins two or more text values into a new text value. For example, the formula ="Line "&ROW() combines the text "Line" with the value produced by the ROW function. If you copy this formula into a column of cells, the cell in row 1 displays the text "Line 1." The cell in row 2 displays "Line 2," and so on.

Comparison Operators

A comparison operator compares two values and produces the logical value TRUE or FALSE.

The comparison operators are:

=	Equal
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
<>	Not equal to

For example, the formula =Profit<25000 produces the value TRUE if the value of Profit is less than 25000. If the value is greater than or equal to 25000, this formula produces the logical value FALSE.

Note If you include any of the comparison operators in the Find What text box when you choose the Formula Find command, they do not function as comparison operators. In the Formula Find command, Microsoft Excel treats comparison operators as normal characters.

Reference Operators

Reference operators combine two references and produce a new reference. The reference operators are:

:	Range — produces one reference to all the cells between and including the two references.
Space	Intersection — produces one reference to the cells common to the two references, or the #NULL! error value when the two references have no cells in common.
,	Union — produces one reference that includes the two references.

With reference operators, you can combine absolute references, relative references, and named areas.

When using a range reference operator to refer to entire columns, rows, or a range of columns or rows, you can use the following:

To refer to	Type
All of column A	*A:A*
All of row 1	*1:1*
All of rows 1 through 3	*1:3*
Entire worksheet	*A:IV* or *1:16384*

When you build formulas, Microsoft Excel uses these range references if you select entire rows or columns.

Order of Operations

If you combine several operators in a single formula, Microsoft Excel performs the operations in the following order:

:	Range
Space	Intersection
,	Union
–	Negation
%	Percent
^	Exponentiation
* and /	Multiplication and division
+ and –	Addition and subtraction
&	Text operator
= < > <= >= <>	Comparison operators

If you want to alter this order, use parentheses to group expressions in your formula. Microsoft Excel first calculates the expressions in parentheses, and then uses those results to calculate the formula. For example:

This formula	Produces this value
=5*4+2	22
=5*(4+2)	30

Related Information

Reference

For information on	See
Calculations in Microsoft Excel	Calculation
Using references	References
Logical values	Logical value
Entering and editing formulas	Formula Formula bar

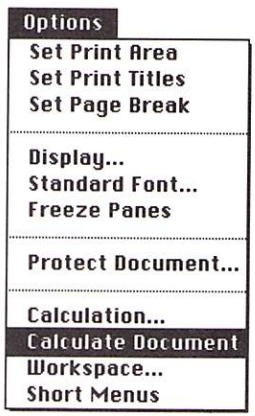
Options Calculate Document command

Calculates only the active worksheet, chart, or macro sheet. Like the Options Calculate Now command, which calculates all open documents, Options Calculate Document calculates according to the Precision As Displayed setting in the Options Calculation dialog box.

Calculate Document only appears on the Options menu if you hold down Shift when you select the Options menu. Calculate Document appears in place of the Calculate Now command.

Normally, you use Options Calculate Document only when the Options Calculation dialog box is set to Manual. When Options Calculation is set to Automatic, calculation is done for you automatically.

Note Even when your worksheet is set to automatic calculation, the Options Calculate Document command is useful for calculating the circular portion of an iterative model. For more information, see **Iteration.**



Options Calculate Now command

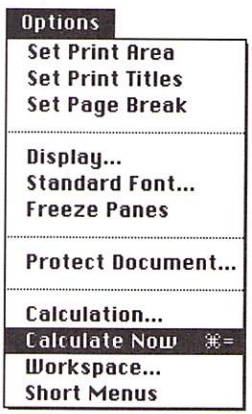
Calculates worksheets and charts, or a formula you are creating in the formula bar.

You need to use Options Calculate Now on a worksheet or chart only when the Options Calculation dialog box is set to Manual. When Options Calculation is set to Automatic, Microsoft Excel calculates open worksheets and charts automatically.

Note Even when your worksheet is set for automatic calculation, Options Calculate Now is useful for calculating the circular portion of an iterative model. For more information, see **Iteration.**

For All Documents

Options Calculate Now normally calculates all formulas in all open documents.



For Active Document Only

If you want to calculate the formulas on only the active document, hold down Shift when you select the Options menu. The Options Calculate Document command appears in place of Options Calculate Now.

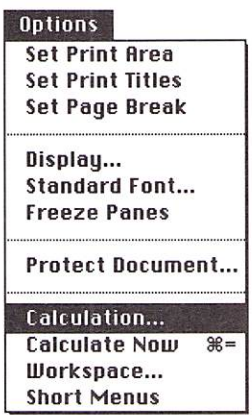
In the Formula Bar

When the formula bar is active, and the formula you are editing begins with an equal sign, Options Calculate Now calculates the formula and replaces it with the result of that formula. For example, if you want to enter a number that is the result of a formula, you can enter that formula and choose Options Calculate Now.

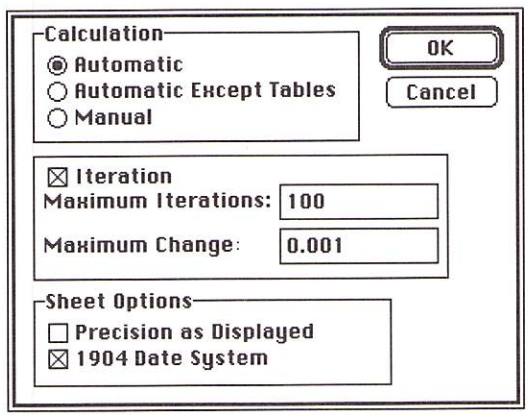
You can also calculate part of a formula by selecting that part and choosing Options Calculate Now. The selected part of the formula changes from a variable to a constant.

Options Calculation command

Controls when formulas in open documents are calculated.



The time it takes to calculate the open documents depends on the number and size of the open documents and the complexity of the formulas. Microsoft Excel calculates as few formulas as possible whenever you make a change to a document, but you may want to turn off automatic calculation for quicker response when making many entries in a complex worksheet.



Calculation

Automatic	Every time you change a value, formula, or name, all formulas that depend on that value, formula, or name are automatically calculated, including tables. All worksheets start with and use automatic calculation until you change it.
Automatic Except Tables	Calculates all dependent formulas except tables. This option is available because tables slow the calculation of the rest of the worksheet. You can calculate all open worksheets, including their tables, with the Options Calculate Now command.
Manual	Calculates all open documents only when you choose the Options Calculate Now or Chart Calculate Now command. Calculates just the active document when you choose the Options Calculate Document command.

Iteration Controls iteration. When this check box is turned on, you can limit iteration by setting either or both of the following options. If you type a number in both boxes, iteration ends as soon as either maximum is reached. Unless you specify otherwise, Microsoft Excel stops iterating after 100 iterations, or when all iterating values on the model change by less than 0.001. For more information, see **Iteration.**

Maximum Iterations Limits the number of iterations before calculation stops.

Maximum Change Also limits the number of iterations; when all the iterating values change by less than the number in this box, iteration stops.

Precision As Displayed Controls how values are stored in cells.

When you create a new worksheet, values are stored at full precision — 15 digits — and all calculations use the entire stored value no matter how the values are formatted and displayed.

If you turn on this check box, the value of each cell is altered to be whatever is displayed, and only the displayed value of each cell is used for calculations.

For example, if a cell contains the value 23.158, and is formatted to show only two decimal places, the displayed value is 23.16. If you calculate your worksheet with Precision As Displayed, the value of that cell changes to 23.16, and 23.16 is used by any formula that refers to that cell.

Important Any constant values on your worksheet that are formatted to display a value other than the full stored value change when you choose Precision As Displayed, and the rounded number is stored in place of the full value. Turning off Precision As Displayed does not restore the numbers to their original values.

Because you lose accuracy with Precision As Displayed, Microsoft Excel asks you to confirm the change when you click the OK button.

Use Precision As Displayed only when the results of formulas do not seem to match the values used to calculate the formulas. For example, if you have two cells containing the value 23.006, and you add them together, the result is 46.012. If all three cells are formatted to display only two decimal places, the result is $23.01 + $23.01 = $46.01, which appears to be wrong. On the other hand, Precision As Displayed would produce a result of $23.01 + $23.01 = $46.02.

Precision As Displayed does not affect numbers in General format. Numbers in General format are always calculated to full precision.

Microsoft Excel calculates faster when using full precision, because with Precision As Displayed, Microsoft Excel has to round off the numbers as it calculates.

1904 Date System Changes the starting date from which all dates on the worksheet are calculated. Dates are stored internally as serial numbers. You can view a date as a serial number by using the Format Number command to change the cell's format to General.

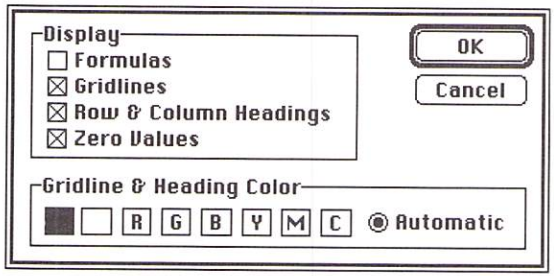
Microsoft Excel for the Macintosh normally uses the 1904 date system, in which the date serial number 1 produces a date of January 2, 1904. In the 1900 date system, which is used in the file formats for WKS, WK1, and Microsoft Excel for Windows, the date serial number 1 produces a date of January 1, 1900.

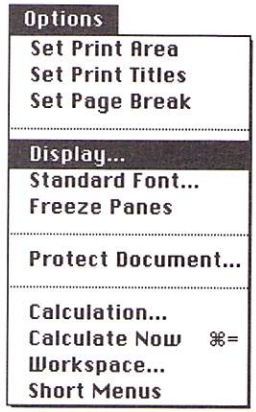
Microsoft Excel normally recognizes the file format and sets this option for you. If the dates in your worksheet are off by four years, change this option. For information on dates, see **Date.**

Options Display command

Controls whether the screen displays formulas, gridlines, row and column headings, and zero values. Options Display also controls the color of gridlines and row and column headings.

The settings in the Options Display dialog box affect only the active worksheet window.





Formulas Displays the contents of each cell instead of the values produced. This option also left-aligns all cell contents and doubles the width of all columns to accommodate the formulas.

Gridlines Displays gridlines on your screen; to remove them, turn off this check box. If you don't want gridlines in your printed document, use the File Page Setup command to turn them off.

Row & Column Headings Displays the numbered headings at the left of each row, and the lettered or numbered headings at the top of each column.

If you don't want row and column headings in your printed document, use the File Page Setup command to turn them off.

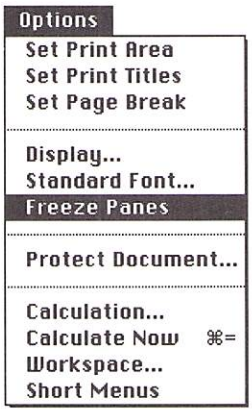
Zero Values Displays all zero values. If you turn off this check box, Microsoft Excel displays all zero values as blank cells.

This option does not affect cells that have been formatted specifically to show zeros. For information on formatting numbers, see **Format Number command.**

Gridline and Heading Color Sets gridline and heading color for the active worksheet window. Normally, gridline and heading color is the same as the text color defined in Control Panel.

Options Freeze Panes command

(Full Menus)



Freezes the top and/or left panes you have created on the active worksheet with the split bars. Use Options Freeze Panes when you want to keep row or column titles on the screen while scrolling to other parts of the worksheet.

When you choose Options Freeze Panes, panes to the left of a vertical split do not scroll horizontally; panes above a horizontal split do not scroll vertically.

With frozen panes, you cannot scroll into the frozen part of the worksheet. For example, if you choose Options Freeze Panes and the top pane contains rows 1 through 4, you cannot scroll the lower pane above row 5.

The difference between frozen panes and unfrozen panes is that with unfrozen panes you can independently scroll the panes above a horizontal split or to the left of a vertical split.

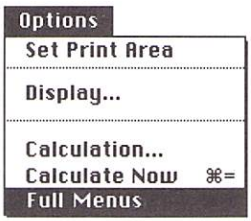
For information on creating and freezing panes on your worksheet, see **Windows.**

Options Full Menus command

Changes the menus to show all available commands. Options Full Menus affects all menus for all documents, including charts.

Use full menus when you want to use commands that aren't available on short menus.

Full Menus appears on the Options menu when you are using short menus. When a chart is the active document, Full Menus appears on the Chart menu.



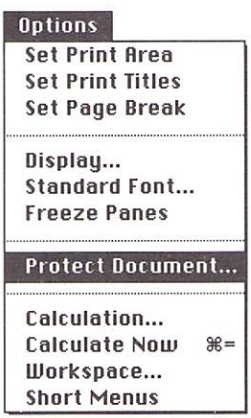
Options Protect Document command

(Full Menus)

Controls whether cell protection formats take effect and whether windows can be moved, sized, or otherwise altered. You specify cell protection formats with the Format Cell Protection command. When the active worksheet is protected, the command changes to Options Unprotect Document.

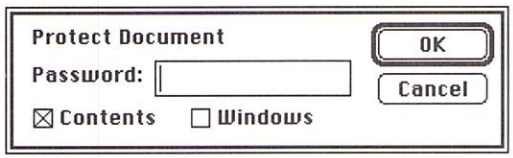
Options Protect Document is similar to Chart Protect Document, which you use to protect charts.

Options Protect Document affects the entire worksheet. If you turn off gridlines with the Options Display command, Microsoft Excel underlines any unlocked cells on the protected worksheet.



Individual cells can be locked, unlocked, hidden, and unhidden with the Format Cell Protection command. For information on changing protection for individual cells, see **Format Cell Protection command.**

For more information, see **Protecting or hiding data** and **Options Unprotect Document command.**



Password Type a password, using any combination of letters, numbers, and symbols. The password you type when you reverse protection of a worksheet must be identical to the password you type when you protect the worksheet. A password can be up to 16 characters long.

Important If you lose your password, you cannot reverse protection of the worksheet. It's a good idea to keep a list of your passwords in a safe place.

If you are protecting your worksheet from yourself to avoid changing important information inadvertently, you may want to protect your document without a password. If you click the OK button in the Protect Document dialog box without typing a password, you don't need to type a password when you unprotect the document.

Using a password to protect a document from being changed is different from using a password to protect a document from being opened. For information on using a password to protect a document from being opened, see **File Save As command.**

Contents Protects all aspects of a worksheet except its windows. In a protected worksheet you cannot change the contents or format of locked cells.

Windows Prevents the worksheet's windows from being moved, sized, or hidden. A protected window can be closed only with the File Close command.

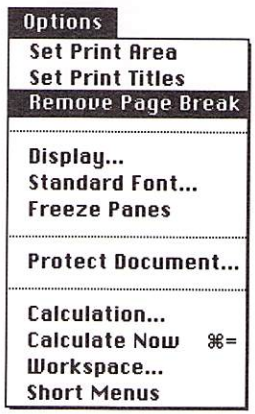
Options Remove Page Break command

(Full Menus)

Removes manual page breaks that you set with the Options Set Page Break command. Does not remove automatic page breaks.

This command appears only when the active cell is directly below or to the right of a manual page break. When it appears, Options Remove Page Break replaces the Options Set Page Break command.

For more information, see **Printing a document.**



Options Set Page Break command

(Full Menus)

Sets manual page breaks for a printed worksheet.

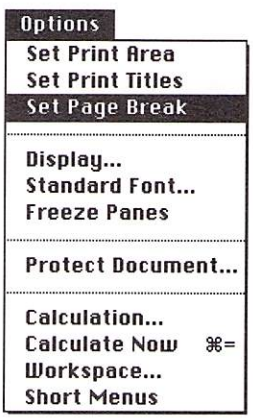
When you print a worksheet that is too large to fit on one page, Microsoft Excel breaks pages automatically based on cell size and the margin settings in the File Page Setup dialog box. Use Options Set Page Break to override the automatic page breaks by setting your own manually. Setting a manual page break changes the automatic page breaks that follow.

When you choose Options Set Page Break, manual page breaks appear above and to the left of the active cell. If the active cell is in column A, a manual page break is added only above the cell. If the active cell is in row 1, a manual page break is added only at the left edge of the cell.

Manual page breaks appear darker than automatic page breaks and remain on a worksheet until you remove them with the Options Remove Page Break command.

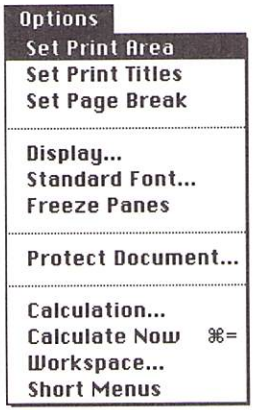
Manual page breaks shift if you insert or delete entire columns or rows.

For information on removing page breaks, see **Options Remove Page Break command.** For information on printing a document, see **Printing a document.**



Options Set Print Area command

(Full Menus)



Defines the print area — the area of the worksheet that prints when you choose the File Print command. The print area also controls which notes are printed.

A new worksheet does not have a set print area, so all cells containing data are printed until you set a smaller print area.

To print an area smaller than the entire area of the worksheet containing data, select the range of cells you want to print and choose Options Set Print Area. Microsoft Excel names the selection Print_Area. To print the area, use the File Print command.

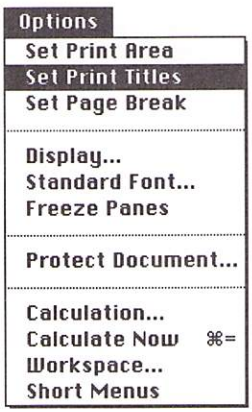
If you choose Options Set Print Area while you have a multiple selection, when you choose the File Print command, the individual selections are printed one after the other in the order they were selected.

If you want to print the entire worksheet again, select the entire worksheet by clicking the box in the upper-left corner of the worksheet at the intersection of the row and column headings, then choose Options Set Print Area. An alternative method is to delete the name Print_Area with the Formula Define Name command.

For more information, see **Printing a document.**

Options Set Print Titles command

(Full Menus)



Defines entire rows or column of text you want used as titles in the printed document.

Microsoft Excel prints the titles whenever it prints any cells in a row or column that intersects the area you define. The titles are printed on every page containing such cells. You can define one or more rows and/or columns as print titles, as long as the rows or columns are adjoining.

The rows and/or columns that you define as titles can be anywhere in the worksheet. A print title applies to all cells in the same row or column, in the same way that a row or column heading number does: a cell need only share the row or column with a print title for the title to be printed above or to the left of that cell.

To define print titles, select the entire rows and/or columns containing the text you want to use for titles, then choose Options Set Print Titles. Microsoft Excel names the selection Print_Titles.

Select all of the rows and columns you want to define as the Print_Titles area in the same way you make any multiple selection. For information on multiple selections, see **Selection** and **Keyboard.**

Note Do not include the print titles as part of the print area, or the titles will be printed twice on the first page. If the print titles appear twice on the first page, select everything you want printed except the Print_Titles cells, then choose the Options Set Print Area command.

For more information on printing, see **Printing a document.**

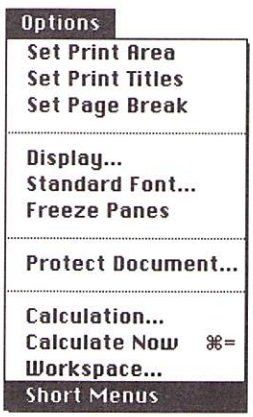
Options Short Menus command

(Full Menus)

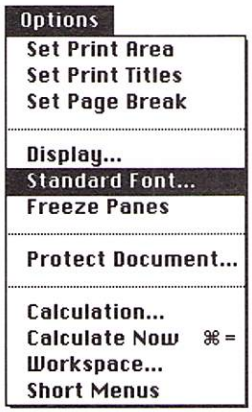
Changes the menus to show fewer commands. Options Short Menus affects menus for all documents, including charts.

Short Menus contain the commands you use most often, so you can find them more quickly and use Microsoft Excel more efficiently. Use short menus for normal work, or when you are first learning to use Microsoft Excel.

Short Menus appears on the Options menu when you are using full menus. Options Short Menus works exactly the same as Chart Short Menus, which appears when you are using full menus and a chart is the active document.



Options Standard Font command



Controls the Standard font used in your worksheet. All cells in your worksheet use the Standard font until you change the font of selected cells with the Format Font command. If you change the Standard font, all cells that have not had a different font applied to them change to the new definition of the Standard font.

Font The fonts in the System folder on your startup disk are listed in the list box. Scroll to see the available fonts and select one, or type in the name of an available font.

The font definition you select applies only to the active worksheet.

If you want to use fonts that are different from the ones on your disk, you can use the Font D/A Mover to add or delete fonts. See your Macintosh owner's guide for details.

Size Select or type a font size. If you type a size different from the ones available for a particular font, Microsoft Excel produces the size as closely as possible, but the results may look ragged.

Microsoft Excel automatically adjusts the height of all rows set to Standard Row Height to accommodate the new font size. If you have set the row height to a specific height in the Format Row Height dialog box, the row stays that height until you change it or set it to Standard Row Height. Fonts larger than the row height will appear clipped. For more information on changing the row height, see **Format Row Height command.**

Microsoft Excel also adjusts the width of columns to accommodate the new font size.

Style Turn on any combination of the available font styles.

Bold	Makes the Standard font bold
Italic	Makes the Standard font italic
Underline	Underlines the Standard font
Strikeout	Puts a horizontal line through the Standard font
Outline	Makes the Standard font outlined rather than solid
Shadow	Adds a shadow to the Standard font

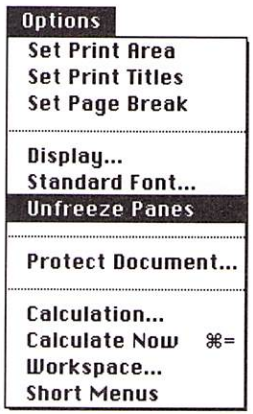
Color Select a color. If you select Automatic, Microsoft Excel automatically chooses a color that works with your system's color settings. If you do not have a color monitor, you can still set a color. The setting is remembered and displayed correctly when the worksheet is opened on a computer with a color monitor.

Options Unfreeze Panes command

(Full Menus)

Unfreezes frozen panes in your worksheet. Unfreeze Panes appears on the Options menu only when you have frozen panes created with the Options Freeze Panes command.

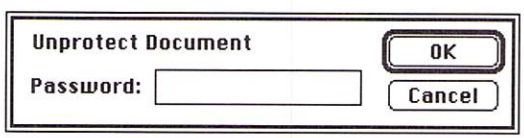
For information on creating and freezing panes on your worksheet, see **Windows.**



Options Unprotect Document command

(Full Menus)

Reverses protection for a protected document. Options Unprotect Document is available when a protected worksheet is active. When the active worksheet is unprotected, the command changes to Protect Document.



Password Type the password for the worksheet. The password must be identical to the password you typed when you protected the worksheet.

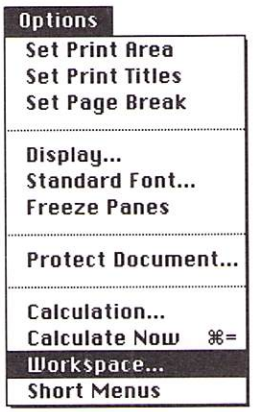
Note If you did not use a password when you protected the document, Microsoft Excel unprotects the document without displaying the dialog box.

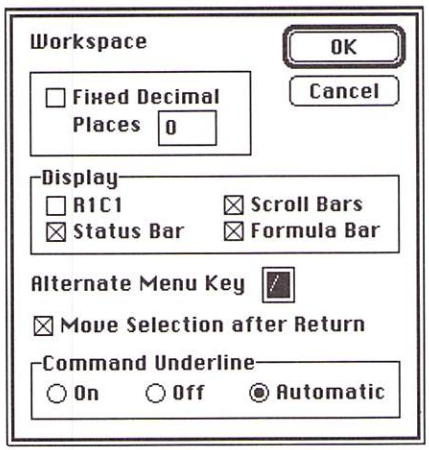
For more information, see **Protecting or hiding data** and **Options Protect Document command.**

Options Workspace command

(Full Menus)

Controls settings that apply to the entire Microsoft Excel session.





Fixed Decimal Places Automatically enters the number of decimal places you want so you don't have to type the decimal point for each number you enter. A positive number moves the decimal point to the left, a negative number moves the decimal point to the right, and a zero does not move the decimal point.

For example, if you set Fixed Decimal Places at 2, and you type *1234* in a cell, the number is entered as 12.34. If you set Fixed Decimal Places at −2 and you type *1234* in a cell, the number is entered as 123400.

Fixed Decimal Places only affects values for which you do not use a decimal point. If you include the decimal point when you enter a value into a cell, any settings in Fixed Decimal Places are ignored.

Note There is a difference between setting Fixed Decimal Places to 2 and formatting a cell to display two decimal places. If you enter 1234 into a cell when Fixed Decimal Places is set to two places, the stored value is 12.34 and the displayed value is 12.34. If you enter 1234 into a cell formatted to display two decimal places, the stored value is 1234 and the displayed value is 1234.00.

R1C1 Displays row and column headings and cell references in the R1C1 reference style.

Your worksheets normally use the A1 reference style in row and column headings and for cell references in formulas. With the R1C1 style, rows and columns are both numbered, and references are different, as shown by the examples in the following table.

A1 reference	Corresponding R1C1 reference
=$B$3	=R3C2
=$E$7	=R7C5

Scroll Bars Displays scroll bars for the active document. Scroll bars show your relative position in a worksheet and allow for fast scrolling with a mouse. Turn off this option to turn off scroll bars and see more of your document.

Status Bar Displays the status bar, which shows the current status of many conditions in Microsoft Excel, such as Num Lock and Edit mode.

Formula Bar Displays the formula bar. The formula bar is where you edit the contents of a cell. If you turn off this option, the formula bar does not appear even when you edit the contents of a cell.

Alternate Menu Key You can choose commands in Microsoft Excel with the period on the numeric keypad in non-Num Lock mode, or with the key specified in this option. If you want to choose commands with another key, type it here.

Move Selection After Return When this option is turned on, pressing Return in a worksheet enters the contents of the formula bar into the cell and moves to make the next cell down the active cell.

Turn this option off if you want the active cell to remain active after entering the contents of the formula bar.

Command Underlines

Automatic	Turns on command underlines only when you choose a command with a menu key
On	The command underlines are always displayed
Off	The command underlines are never displayed

For more information on choosing commands with the keyboard, see **Command, menu, and dialog box.**

Important Remember that the settings in the Options Workspace dialog box apply to the entire Microsoft Excel session.

Overlay chart

An **overlay chart** is a second chart plotted on top of the main chart in the same chart window. An overlay and main chart are identical in size and position. You can use a different chart type for an overlay and format it separately from the main chart. Adding axes to an overlay allows you to plot data with a different value scale or units of measure from the main chart.

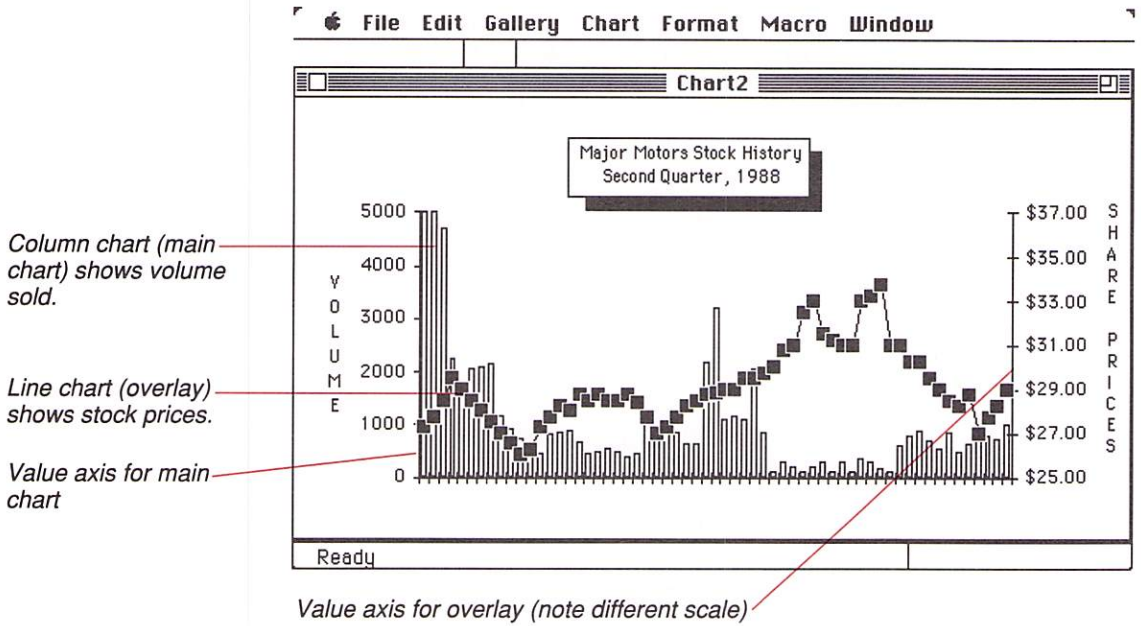
This topic explains:

- Uses for an overlay chart
- Creating an overlay chart
- Changing an overlay chart type
- Reformatting an overlay chart
- Adding or deleting axes for an overlay chart
- Changing data series distribution for an overlay chart
- Deleting an overlay chart

Uses for an Overlay Chart

You can use an overlay chart to create a complex graphic that compares two different kinds of data. Juxtaposing data graphically often conveys more fully the correlations between the data. You can use a chart with an overlay to combine data, communicating a message of wider scope than if you were to present each set of data individually.

For instance, as one step in analyzing a company's stock performance, you might use a chart with an overlay to show the relationship between share prices and volume, as in the following illustration:



Creating an Overlay Chart (Full Menus)

There are two ways to create an overlay chart:

- With the Gallery Combination command. This procedure is best if you've just created a new chart and haven't yet customized it.
- With the Chart Add Overlay command. This procedure preserves your formatting changes if you've already customized a chart.

To create an overlay for a new chart	To create an overlay for a customized chart
1 With the chart window active, choose Gallery Combination. 2 Select the format you want. 3 Click the OK button.	With the chart window active, choose Chart Add Overlay. Microsoft Excel plots a line chart as the default overlay.

When you create an overlay chart, Microsoft Excel divides the data series evenly between the main and overlay charts. Then it puts the first group of data series into the main chart and the second group into the overlay chart. In the case of an odd number of data series, the main chart has one data series more than the overlay chart. You can override these defaults (see "Changing Data Series Distribution for an Overlay Chart," later in this topic).

For example, if you have four data series, the first two are plotted in the main chart; the last two go into the overlay chart. If you have five data series, the first three go into the main chart, and the last two go into the overlay chart.

Changing an Overlay Chart Type
(Full Menus)

You can switch to another overlay chart type and still keep your customized changes.

1 Choose Format Overlay.
2 Under Type, select the chart type you want.
3 Click the OK button.

For more information, see **Format Overlay command.**

Reformatting an Overlay Chart
(Full Menus)

You can reformat elements of an overlay chart and still keep your other customized changes. For example, if you've just changed your overlay chart to a line chart, you can add drop lines with the Format Overlay command. Dialog box options vary according to chart type.

1. Choose Format Overlay.
2. Select the options you want.
3. Click the OK button.

Note You can add gridlines only to a main chart. For more information, see **Chart axis.**

You format data series in an overlay chart the same way you do in the main chart. For information on formatting data series, see **Chart Data series.**

Adding or Deleting Axes for an Overlay Chart (Full Menus)

You can add both a value and a category axis to an overlay chart. In other words, a chart with an overlay can have as many as four axes.

1. Choose Chart Axes.
2. Select the options you want.
3. Click the OK button.

You reformat the scale, text, and design (line style and weight, color, and tickmark style and labels) of overlay chart axes the same as you do the axes on the main chart. For information on formatting axes, see **Chart axis.**

Changing Data Series Distribution for an Overlay Chart (Full Menus)

Use this procedure to override the Microsoft Excel default for data series distribution in an overlay chart.

1. Choose Format Overlay.
2. In the First Series in Overlay Chart box, type the number of the first data series you want plotted in the overlay chart.
3. Click the OK button.

For more information, see **Format Overlay command.**

You can also override defaults for data series distribution by changing the plot order argument in the series formula, the formula Microsoft Excel uses to define and plot a data series. For information on editing the series formula, see **Series formula.**

Deleting an Overlay Chart
(Full Menus)

The Chart Add Overlay command changes to Chart Delete Overlay on the menu whenever a chart window with an overlay chart is active.

▣ Choose Chart Delete Overlay.

Microsoft Excel deletes the overlay chart and puts the data series from the overlay chart into the main chart. For information on deleting a data series, see **Chart data series.**

Related Information

Reference

For information on	See
Chart basics; chart customizing options	Chart

Sampler

Tracking and Forecasting Stock Prices
Presenting Data Graphically

Printing a document

You can print your worksheets, macro sheets, charts, and worksheet or macro sheet notes in a variety of formats and preview your printed pages before you print. In addition, you can create Info window printouts that provide thorough information about any or all cells in a worksheet, including notes attached to the cells.

This topic explains:

- Printing basics

  Installing printers
  Choosing a printer and/or printer settings

- Page layout and pagination

  Setting up page layout
  Setting manual page breaks
  Deleting manual page breaks
  Printing row and/or column titles

- Previewing and printing a document

  Previewing a printed page
  Printing a document
  Printing sections of a worksheet

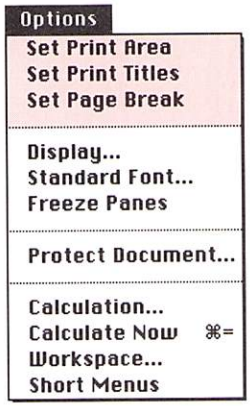
This topic does not discuss Info window printouts in detail. For information on creating Info window printouts, see **Info window.**

Note All worksheet printing options also apply to macro sheets.

Printing Basics

The commands for printing documents are on these menus (full menus shown):

- Use these File menu commands to control printer setup, page layout, page preview, and the main printing procedures for worksheets, macro sheets, and charts.



- Use these Options menu commands to control additional print options for worksheets and macro sheets: printing part of a document, setting manual page breaks, and specifying rows and columns as print titles.

For more information on each command, see the topic of the same name (for example, **File Page Setup command**).

Installing Printers

Before you can select a printer, you must first install the printer driver for the printer you want to use. The following procedure outlines how to install printer drivers. Consult your printer manual for a more detailed explanation.

1. Copy the printer driver(s) for your printer(s) to the System folder of the disk you use to start up your Macintosh.
2. If you will be printing on an Apple LaserWriter, open the Installer program (provided with your LaserWriter) and install the LaserWriter. See your LaserWriter manual for instructions on using Installer.
3. For best printing results, install the fonts designed for your printer using the Font/DA Mover (provided with your Macintosh system). The fonts for your printer are provided with the printer.

   For example, fonts with city names, such as Geneva or New York, are designed for the ImageWriter. They print well on an ImageWriter but look ragged when printed on a LaserWriter.

Note Microsoft Excel can also print on several brands of serial typewriters and dot matrix printers, including Apple, Brother, Diablo, NEC, and TTY. The printer driver software for these printers is not included with the Apple Macintosh system software, but can be obtained through many sources, including your local dealer.

Choosing a Printer and/or Printer Settings

You use the Chooser command on the Apple menu to select a printer from the list of printers you've installed.

1. Choose the Chooser command from the Apple menu.
2. Click the icon for the printer you want to use.
3. If you selected an AppleTalk printer and your AppleTalk network is interconnected with other AppleTalk networks, you'll see a list box displaying the AppleTalk Zones that are available to your Macintosh. Select the zone containing the printer you want to use.
4. If you selected an ImageWriter, in the Select a Printer Port list box, click the icon for the Macintosh port that is connected to your ImageWriter.
5. If you selected an AppleTalk printer, select the name of the printer you want to use from the list box.
6. Click the close box to close the Chooser dialog box.

Page Layout and Pagination

This section explains basic procedures for controlling page layout and page breaks for your printed document.

Setting Up Page Layout

You control these page layout options with the File Page Setup command (settings vary, depending on which type of window is active):

- **Headers and footers** — Specific content, font, and position on page (for information on the codes you use to format headers and footers, see **Headers and footers**).
- **Print gridlines** — Print with or without (worksheets and macro sheets only).
- **Margins** — Top, bottom, right, left.
- **Paper size and orientation** — Paper sizes available vary depending on the selected printer; orientation can be vertical (portrait) or horizontal (landscape).
- **Print row and column headings** — Print with or without (worksheets and macro sheets; also controls whether or not cell references are included when printing cell notes only).
- **Size** — Screen size, fit to page, full-page (charts only).

Additional printer-specific page setup options may also be available for your printer. For more information, see your printer manual.

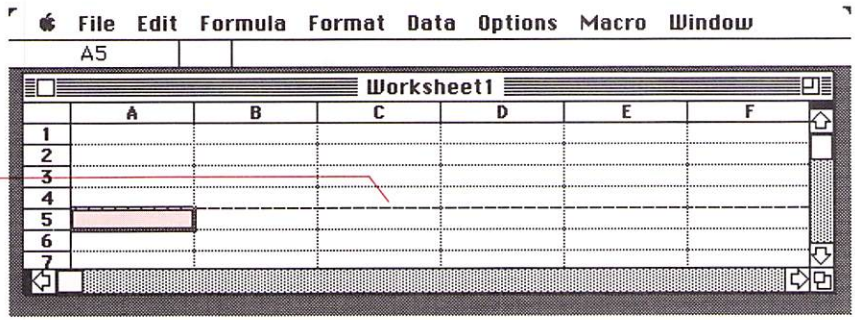
Note Printing with or without gridlines or row and column headings is independent of their on-screen display, which you control with the Options Display command. For more information, see **Display options.**

1. Choose File Page Setup.
   The dialog box presents different options, depending on the type of window that is active (worksheet, chart, or Info window) and the type of printer selected.
2. Set the options you want.
3. Click the OK button.

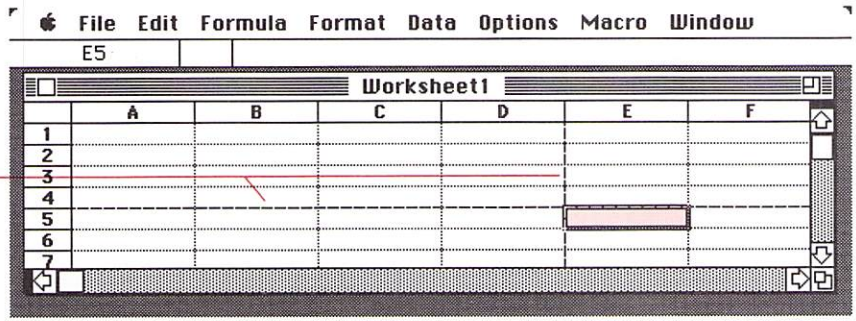
Setting Manual Page Breaks
(Full Menus)

For a document longer than one page, Microsoft Excel automatically inserts page breaks to divide it into pages. Page breaks are placed according to the margin settings of the File Page Setup command. For worksheets and macro sheets, Microsoft Excel first paginates vertically to the last row of data, then horizontally to the last column of data.

You can also set manual page breaks with the Options Set Page Break command. The following illustrations show how to indicate where you want manual page breaks:



For this page break, select cell A5 and choose Options Set Page Break.



For these page breaks, select cell E5 and choose Options Set Page Break.

When you set a manual page break, Microsoft Excel adjusts the automatic page breaks in the rest of the worksheet. You can check page breaks by looking at the document; manual page breaks are displayed darker than automatic page breaks. Page breaks are saved with the document.

1. Select the cell below and to the right of the gridlines where you want the page breaks.
2. Choose Options Set Page Break.

For more information, see **Options Set Page Break command.**

Deleting Manual Page Breaks
(Full Menus)

The Options Set Page Break command changes to the Options Remove Page Break command when you select a cell below or to the right of a manual page break.

1. Select any cell directly below or to the right of the manual page break.
2. Choose Options Remove Page Break.

For more information, see **Options Remove Page Break command.**

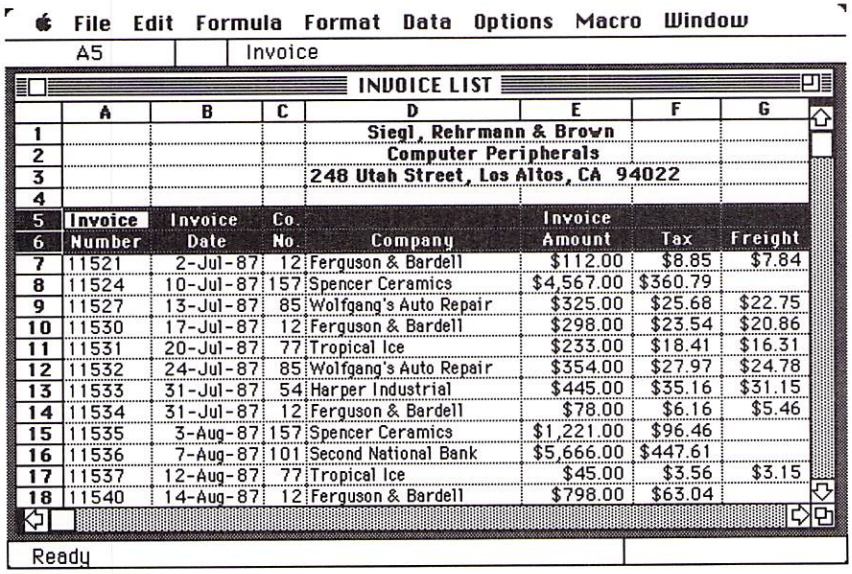
Printing Row and/or Column Titles
(Full Menus)

You can specify **print titles,** certain rows and/or columns to be printed as titles on each page when you print a worksheet. This option is especially useful for large documents in which you need to keep track of row or column labels that identify long sections of data. The rows or columns you use for print titles can be anywhere on the worksheet. Microsoft Excel prints them as titles whenever it prints any cells in the same column or row. Print titles in rows are printed at the top of a page; print titles in columns are printed at the left of a page.

Note You must select an entire row or column for print titles. You can designate multiple rows and columns, but they must be adjacent rows (for example, rows 1 and 2) or adjacent columns (for example, columns D and E).

The following illustration shows print titles for a row:

To print the titles in rows 5 and 6 at the top of every page, select the rows and choose Options Set Print Titles.



	A	B	C	D	E	F	G
1				Siegl, Rehrmann & Brown			
2				Computer Peripherals			
3				248 Utah Street, Los Altos, CA 94022			
4							
5	Invoice	Invoice	Co.		Invoice		
6	Number	Date	No.	Company	Amount	Tax	Freight
7	11521	2-Jul-87	12	Ferguson & Bardell	$112.00	$8.85	$7.84
8	11524	10-Jul-87	157	Spencer Ceramics	$4,567.00	$360.79	
9	11527	13-Jul-87	85	Wolfgang's Auto Repair	$325.00	$25.68	$22.75
10	11530	17-Jul-87	12	Ferguson & Bardell	$298.00	$23.54	$20.86
11	11531	20-Jul-87	77	Tropical Ice	$233.00	$18.41	$16.31
12	11532	24-Jul-87	85	Wolfgang's Auto Repair	$354.00	$27.97	$24.78
13	11533	31-Jul-87	54	Harper Industrial	$445.00	$35.16	$31.15
14	11534	31-Jul-87	12	Ferguson & Bardell	$78.00	$6.16	$5.46
15	11535	3-Aug-87	157	Spencer Ceramics	$1,221.00	$96.46	
16	11536	7-Aug-87	101	Second National Bank	$5,666.00	$447.61	
17	11537	12-Aug-87	77	Tropical Ice	$45.00	$3.56	$3.15
18	11540	14-Aug-87	12	Ferguson & Bardell	$798.00	$63.04	

To print row and/or column titles:

1. Select the rows or columns that contain the titles you want printed on every page.

   To specify both rows and columns, make a multiple selection, with one area for the title columns and one area for the title rows.
2. Choose Options Set Print Titles.

Microsoft Excel names the area you selected Print_Titles. You can refer to this area by name as you would any other named range. Whenever you print the worksheet, Microsoft Excel prints the titles you specified.

To cancel Print_Titles:

1. Choose Formula Define Name.
2. In the list box, select the name Print_Titles.
3. Click the Delete button.
4. Click the OK button.

For more information, see **Options Set Print Titles command.**

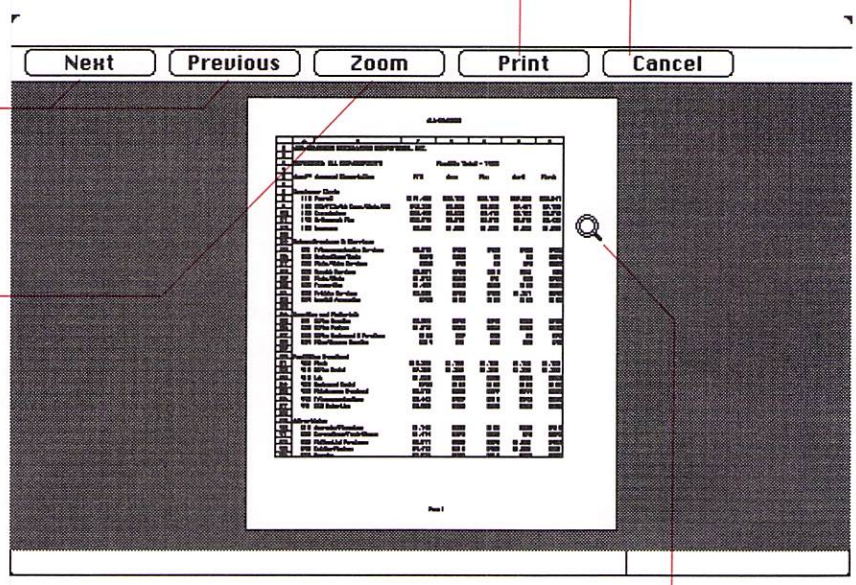
Previewing and Printing a Document

This section explains procedures for previewing printed pages of your documents and printing entire or partial documents.

Previewing a Printed Page

Before you print a document, you can use the Microsoft Excel Page Preview option to see exactly how printed pages will appear and make further adjustments, if necessary. You control the Page Preview option with the File Print command.

When you first choose Page Preview, the first page of the document is displayed in reduced size, as shown in the following illustration:


Click Print to print directly from preview window.
Click Cancel to return to document window.
Next
Previous
Zoom
Print
Cancel
Click Next or Previous to see next or previous page of printout.
Click Zoom to magnify page.
The mouse pointer becomes a magnifier. To magnify a feature on the page, click the area you want to see more closely.

You can print from page preview or cancel page preview so you can make further adjustments to the page layout before you print.

To preview a page:

1. Choose File Print.
2. Turn on the Page Preview check box.
3. Click the OK button.
   Microsoft Excel displays the first page of the document in reduced size. The mouse pointer becomes a magnifier.
4. To examine any area of the page in more detail, move the magnifier and click the area of the document you want to see more closely.
   Microsoft Excel magnifies the document and displays that area on the screen.
5. To return to the reduced page view, click anywhere on the page.
   To view the next page, click the Next button. You can use the magnifier to enlarge this page also.
   To go back to the previous page, click the Previous button.
   To print the document, click the Print button.
   To return to the document window to make further changes, click the Cancel button.

Alternately, you can use the keyboard to manipulate the view in page preview.

- To view the next page, press N. To view the previous page, press P.
- To magnify the page so you can see more detail, press Z to choose the Zoom button.
- Use the Direction keys to scroll the magnified page.
- You can also use the following keys to scroll the magnified page: Press Command+ the Left Arrow, Right Arrow, Up Arrow, or Down Arrow key to move to the left, right, top, or bottom edge of the page.
  Press Home to move to the left edge of the page and End to move to the right edge of the page. Press Command+Home to scroll to the top left and Command+End to scroll to the bottom right of the page.
- To return to the reduced page, press Z again.

For more information on the page preview feature, see **File Print command.**

Printing a Document

You use the File Print command to print a document. If you are printing a worksheet, you can specify that Microsoft Excel print only the worksheet, only notes, or both. In addition, you can use the File Print command to specify page range or number of copies, or choose the Page Preview option.

To print a document:

1. Choose File Print.
2. Select the options you want.
3. Click the OK button.

Microsoft Excel displays a message indicating it is printing your document.

To cancel printing:

- Press Command+. (period).

Printing Sections of a Worksheet

Use this procedure if you want to print specific ranges of a worksheet or macro sheet that are not whole pages. If you want to print certain pages of the document, follow the procedure in the preceding section, "Printing a Document," and specify the page range in the From and To text boxes in the File Print dialog box.

1. Select the cell range or ranges you want to print (make a multiple selection if you want noncontiguous areas of the worksheet included in the printout).

   If you have specified print titles, do not include them in any range you select, or they will be printed twice.
2. Choose Options Set Print Area.

Microsoft Excel names the range or ranges you selected Print_Area. You can refer to this area by name as you would any other named range. To print the worksheet, follow the procedure in the preceding section, "Printing a Document." Whenever you print the worksheet, Microsoft Excel prints the area you specified.

To delete the name Print_Area so you can print the entire worksheet:

1. Choose Formula Define Name.
2. Select the name Print_Area in the list box.
3. Click the Delete button.
4. Click the OK button.

Tip You can also print the entire occupied area of the worksheet by selecting the whole worksheet and choosing Options Set Print Area.

For more information, see **Options Set Print Area command.**

Related Information

Reference

For information on	See
Worksheet, chart, and database basics	Worksheet Chart Database
Print and display formats (general overview)	Formatting a document
Formatting fonts	Font

Protecting or hiding data

Protecting or hiding data helps safeguard a document from errors caused by accidental or unauthorized changes. This is especially important if the document contains sensitive information or if it must be shared by several users. You can protect a document in two ways:

- You can prevent someone from opening a document or accessing linked data from a protected document while it is stored on disk.
- You can prevent someone from changing an open document's contents, its windows, or both.

You use different passwords with the two different types of protection, so that you can let someone open a document but not change it.

This topic explains:

- Protecting a document on disk

  Limiting access to a document

  Turning off password protection

- Protecting the contents of a document

  Protecting worksheet cells
  Turning off worksheet cell protection
  Protecting a chart
  Turning off chart protection
  Protecting a document's window
  Turning off window protection

Note All concepts and procedures for protecting or hiding data in worksheets also apply to macro sheets.

Protecting a Document on Disk

You can assign a password to a document using the File Save As command. When you open that document in the future, Microsoft Excel requires you to type the correct password. The password is also required for any linked documents to read data from the document.

Limiting Access to a Document

1. Choose File Save As.
2. Click the Options button.
3. Type a password in the text box.
4. Click the OK button.
5. Click the Save Button.

Important If you forget a password, you can't remove protection from the document. It's a good idea to keep a list of passwords in a safe place.

Turning Off Password Protection

1. Open the document.
2. Choose File Save As.
3. Click the Options button.
4. In the Password box, select the password.
5. Press Backspace to remove the password.
6. Click the OK button.
7. Click the Save button.

Protecting the Contents of a Document

You can protect the contents of worksheet cells, charts, and/or windows. This type of protection is useful when creating models or templates that you want other people to be able to use but not change.

Protecting Worksheet Cells
(Full Menus)

You can lock and/or hide cells on a worksheet with the Format Cell Protection command.

- Locking a cell prevents its contents from being changed.
- Hiding a cell prevents the cell's formula from being displayed in the formula bar when the cell is selected; only the result of the formula is displayed.

You can specify that a cell be locked and/or hidden, but the protection does not take effect until you choose the Options Protect Document command. Choosing the Format Cell Protection command sets a cell's protection status; choosing Options Protect Document puts into effect the protection status of all the cells on the worksheet.

When you open a new worksheet, the protection status for all cells is set as locked and not hidden, and the worksheet is not protected.

To protect worksheet cells:

1. Select the cells whose protection you want to change.
2. Choose Format Cell Protection.
3. Set the protection as you want by turning the Locked and Hidden check boxes on or off.
4. Click the OK button.
5. Repeat steps 1–4 until you've changed protection for all the worksheet cells you want to protect.
6. Choose Options Protect Document.
7. Turn on the Contents check box.
8. Type a password to prevent others from turning off the protection.
   If you just want to protect the document from your own accidental changes, you don't have to type a password.
9. Click the OK button.

Turning Off Worksheet Cell Protection
(Full Menus)

1. Choose Options Unprotect Document.
2. If the document is protected with a password, type the password in the text box.
3. Click the OK button.

Protecting a Chart
(Full Menus)

1. Activate the chart window.
2. Choose Chart Protect Document.
3. Turn on the Contents check box.
4. Type a password to prevent others from turning off the protection. If you just want to protect the document from your own accidental changes, you don't have to type a password.
5. Click the OK button.

Turning Off Chart Protection
(Full Menus)

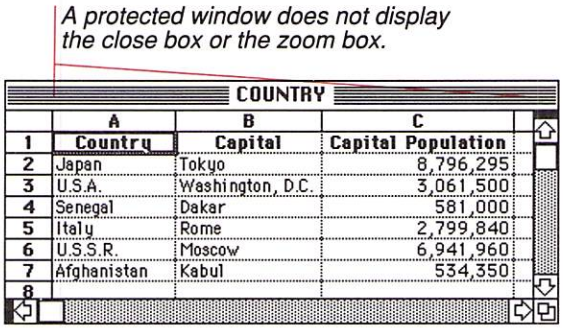
1. Choose Chart Unprotect Document.
2. If the chart is protected with a password, type the password in the text box.
3. Click the OK button.

Protecting a Document's Window
(Full Menus)

Protecting a document's window prevents:

- Resizing or moving a document's windows.
- Opening new windows on the document.
- Closing windows of the document individually.

Limiting the view of your worksheet can make it easier for other people to use it. This type of protection can be used with or without a password and is saved with the document.



As with cell protection, you turn on window protection with the Options Protect Document command.

1. Arrange the size and placement of the window or windows within the workspace.
2. If the active document is a worksheet or macro sheet, choose Options Protect Document.

   If the active document is a chart, choose Chart Protect Document.
3. Turn on the Windows check box.
4. Click the OK button.

Tip In certain applications, you may want to prevent worksheet windows from being scrolled. To prevent scrolling in windows, use the Options Freeze Panes command. This command freezes the top and left panes of the active window. You can also restrict access to the bottom and right panes by reducing the size of the window after freezing its panes. For more information, see **Display options, Windows,** and **Options Freeze Panes command.**

Turning Off Window Protection
(Full Menus)

1. If the active document is a worksheet or macro sheet, choose Options Unprotect Document.

   If the active document is a chart, choose Chart Unprotect Document.
2. If the document is protected with a password, type the password in the text box.
3. Click the OK button.

Related Information

Reference

For information on	See
Linked documents	Linking documents
Preventing window scrolling	Display options Windows Options Freeze Panes command
Hiding rows or columns	Row Column

Sampler

Creating an Automated Invoice System

Quitting Microsoft Excel

Quitting a Microsoft Excel session returns you to the Finder.

1. Choose File Quit.
   If you have changed any of the files in the workspace since you last saved them, Microsoft Excel displays a message asking if you want to save changes.
2. To save changes to open documents, click the Yes button.
   To quit without saving changes, click the No button.
   To cancel the Quit command, click the Cancel button.

Related Information

Reference

For information on	See
Startup procedures	Starting Microsoft Excel Opening a document
Procedures for saving and closing documents	Saving and closing a document

References

A **reference** is the location of a cell or a group of cells on a worksheet. For example, the reference $C$4 refers to the cell in column C of row 4. Using references in formulas lets you use data contained in different parts of a worksheet.

This topic explains:

- Using references

  Relative and absolute references

  Using mixed references

  Changing relative or absolute references

- R1C1 reference style

  Changing to R1C1 reference style

Microsoft Excel also lets you refer to cells in other worksheets. References to cells in other worksheets are called **external references.** For information on external references, see **Linking documents.**

Using References

References make formulas flexible. You can use the same value in many formulas by entering the value in a cell and entering the reference of that cell in the formulas. Then, if you change the value in the cell, Microsoft Excel calculates all the formulas using the new value.

Cell references are based on the column and row headings in a worksheet. When you first start Microsoft Excel, columns are labeled A through IV (A, B, C, . . . Z, AA, AB, AC . . . AZ, BA, BB, BC, and so on through IV). Rows are labeled 1 through 16384. This is known as "A1 reference style." You can also change the column headings to be numbers instead of letters. For information on this reference style, see "R1C1 Reference Style," later in this topic.

The area to the far left of the formula bar displays the reference of the active cell. For more information, see **Formula bar.**

You enter a reference in a formula either by typing the reference or by selecting the cell while the formula bar is active.

Relative and Absolute References

There are two basic types of references: **relative references** and **absolute references.**

A relative reference is like giving someone directions — "go up two blocks and over one." An absolute reference is like a street address — "3812 Atlantic St."

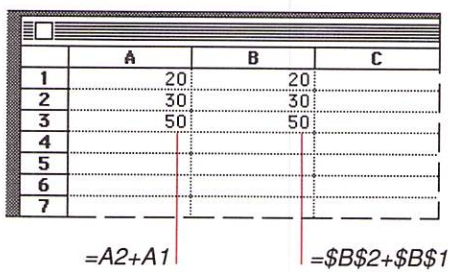
A relative reference tells Microsoft Excel how to find another cell, starting from the cell containing the formula. References such as C4 and F7 are relative references.

An absolute reference tells Microsoft Excel how to find a cell based on the exact location of that cell. An absolute reference is designated by adding a dollar sign ($) before the column letter and the row number. References such as $D$9 and $F$16 are absolute references.

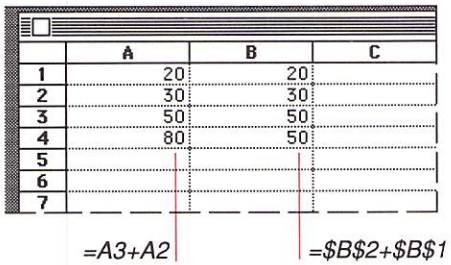
To enter	Type this
Relative reference	A1
Absolute reference	$A$1

The difference between absolute and relative references becomes apparent when you copy or move formulas from one cell to another.

In the following illustration, both cells in the third row have formulas that calculate the sum of the values in the two cells immediately above them. The formula in A3 is built with relative references; the one in B3 is built with absolute references.



When you copy the formulas from row 3 into row 4, the results of both formulas are correct, but the answers are different:



The formula =A3+A2 calculates the sum of the values in the cells in the same column, one row above and two rows above the cell containing the formula. No matter where you copy this formula, Microsoft Excel adds the values in the two cells immediately above it.

The formula =$B$2+$B$1 always adds the values in cells B2 and B1, no matter where you copy this formula on the worksheet.

Because a relative reference in a formula remembers the position of a cell relative to the cell containing the formula, Microsoft Excel adjusts the reference to reflect the new position when the formula is copied elsewhere. For example, suppose you enter the formula =A6+A5+A4 in cell A8. If you copy this formula into B8, Microsoft Excel changes the references to =B6+B5+B4.

If you select a cell while the formula bar is active, Microsoft Excel enters a relative reference. For example, if you are building a formula in A3 and select A1, Microsoft Excel enters A1 as the reference and remembers "the cell two rows up in the same column."

Using Mixed References

If you want to refer to cells so that only the column or row reference is absolute or relative, you can use mixed references. For example, in the reference $A2, the column reference ($A) is absolute and the row reference (2) is relative.

You can type a mixed reference directly, or you can use the Formula Reference command to change a reference. The Formula Reference command cycles through the different combinations of mixed references, starting with the current reference, in the following order: $A$2, A$2, $A2, A2.

Changing Relative or Absolute References

You can use the Formula Reference command to quickly change the reference format of a cell reference to absolute, mixed, or relative format. To change relative or absolute references:

1. Select the cell containing the reference you want to change.
2. In the formula bar, select the reference or references you want to change.
3. Choose Formula Reference as many times as necessary to change the reference to the desired combination of absolute and relative references.

The initial type of cell reference determines how Microsoft Excel converts it, as shown by the following table:

This	Becomes
A1	$A$1
$A$1	A$1
A$1	$A1
$A1	A1

Tip If you are entering a formula and have just inserted a reference you want to change, choose the Formula Reference command. Microsoft Excel converts the reference to the left of the insertion point.

R1C1 Reference Style

Most of the examples in this manual use the A1 reference style, in which the columns are labeled with letters and the rows with numbers. However, there is another way of referring to cells in Microsoft Excel, called R1C1 reference style, in which both rows and columns have numbers. This style is useful for computing row and column position in macros, and especially useful for showing relative references.

In R1C1 style, a cell's location is indicated by an R followed by a row number and a C followed by a column number. In R1C1 style, column headings are labeled 1 to 256 rather than A to IV. For example, the reference R2C2 is equivalent to the absolute reference $B$2 in A1 reference style. When you choose R1C1 style, all formulas and row and column headings change accordingly.

You can change the reference style at any time, and Microsoft Excel adjusts all the references in your formulas for you.

Just as in A1 style, if you select a cell while building a formula in R1C1 style, you enter a relative reference. For example, if you are entering a formula in cell R3C1 and select cell R2C2, Microsoft Excel enters R[−1]C[1] as the reference. If the cell you select is in the same row or column, Microsoft Excel abbreviates and enters RC[1] or R[−1]C.

The following table shows other examples of references in R1C1 style:

This relative reference	Indicates the cell
R[−2]C	Two rows up, same column
RC[−2]	Same row, two columns to the left
R[2]C[2]	Two rows down, two columns to the right

You can enter references to an entire row or column by omitting one half of the reference. For example, enter R[−1] to indicate the entire row above the active cell.

You can also type references instead of selecting cells. For example, type *R[2]C[2]* to enter a relative reference. Type *R2C2* to enter an absolute reference.

You can also mix references in R1C1 style and use the Formula Reference command to change references, as in A1 style.

Changing to R1C1 Reference Style
(Full Menus)

1. Choose Options Workspace.
2. Turn on the R1C1 check box.
3. Click the OK button.

To change back to the A1 reference style:

1. Choose Options Workspace.
2. Turn off the R1C1 check box.
3. Click the OK button.

Related Information

Reference

For information on	See
Absolute and relative references	Absolute reference Relative reference
References to other worksheets	External reference Linking documents
Using references in formulas	Formula Formula bar
Replacing references with names	Names
How moving and copying data affects references	Moving data on a worksheet Copying data and formats

Relative reference

A cell can refer to the contents of another cell in one of two ways: it can make a **relative reference** or an **absolute reference** to another cell.

A relative reference is like telling a friend where you live by saying "go down four blocks and over two." In the same way, you might use the relative reference C5 in cell A1 to have Microsoft Excel look in the cell four rows down and two columns over. If you were then to move or copy the contents of cell A1, Microsoft Excel would look in the cell four rows down and two rows over from the new location.

By contrast, an absolute reference always refers to one specific cell. An absolute reference is like giving your friend a specific address — for example, "1540 Maple Avenue."

In the A1 reference style, absolute references have a dollar sign before the column letter and row number (for example, $B$8); relative references do not (for example, B8). In the R1C1 reference style, relative references have brackets around the row and column numbers (for example, R[8]C[2]); absolute references do not (for example, R8C2).

For more information on relative and absolute references, or on reference styles, see **References.**

Row

On a Microsoft Excel worksheet, a **row** is a complete horizontal line of cells. Each worksheet contains 16,384 rows, numbered 1 through 16384.

This topic explains:

- Changing a row height
- Returning a row to standard height
- Adding a row of blank cells
- Deleting a row

Note All worksheet row options also apply to macro sheets.

Changing a Row Height

When you first create a Microsoft Excel worksheet, each row is set to a standard row height to accommodate the standard font. If you change to a different-sized font, Microsoft Excel adjusts the row height automatically.

You can change the row height manually to adjust for font changes you make or to achieve different effects with borders and shading. For example, using a very narrow row height in combination with borders along the top and bottom of a range of cells produces a double underline.

1. Select a cell in the row you want to change.
   You can also select a range of cells or make a multiple selection. To change row height for the entire worksheet, select an entire column by clicking the column heading.
2. Choose Format Row Height.
3. In the Row Height box, type the row height in number of points.
4. Click the OK button.

In addition, you can change row height by pointing to the bottom gridline in the row heading and dragging the gridline up or down.

For information on border and shading options, see **Borders and shading.** For information on using fonts, see **Font.**

Note Once you have changed the row height to any size other than the standard row height, Microsoft Excel stops adjusting the height when you change to a different font. To change back to automatic row height adjustment, select the row, choose Format Row Height, and turn on the Standard Height check box.

Returning a Row to Standard Height

To return one or more rows to the standard height for the current font:

1. Select the row you want to change.
   Select an entire column of cells if you want to return to standard row height throughout the whole worksheet.
2. Choose Format Row Height.
3. Turn on the Standard Height check box.
4. Click the OK button.

Adding a Row of Blank Cells

1. Select the row above which you want to insert the new row of blank cells.
2. Choose Edit Insert.

Deleting a Row

1. Select the row you want to delete.
2. Choose Edit Delete.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Adjusting, adding, and deleting columns in a worksheet	Column
Overviews of worksheet editing and formatting options	Editing a document Formatting a document
Moving worksheet cells and ranges	Moving data on a worksheet
Copying worksheet cells and ranges	Copying data and formats
Inserting rows and columns	Inserting blank cells

Saving and closing a document

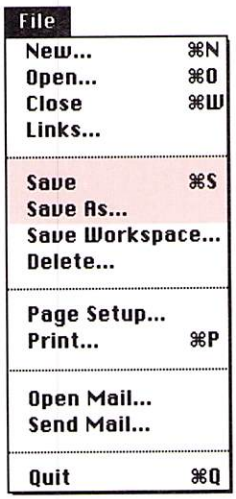
You'll want to save and close documents whenever you finish a session with Microsoft Excel. It's also a good idea to save work frequently during a session so that your work isn't lost in the event of a power interruption or hardware problem. Every document that you save in Microsoft Excel is stored as a file on a disk.

This topic explains:

- Procedures for saving documents
  - Guidelines for naming documents
  - Saving a new document
  - Saving an existing document
- Procedures for closing documents
  - Closing a document window
  - Closing all open documents

Procedures for Saving Documents

The commands for saving individual documents are on the File menu (full menus shown):



- Use File Save to save changes to an existing document.
- Use File Save As to save a new document or to save an existing document under a new name.

With the File Save As command you can:

- Change the file format from the default (Normal) to other file formats that enable you to transfer files between Microsoft Excel and other applications (for example, the WKS format for Lotus 1-2-3 files or the SYLK format for Microsoft Excel version 1.5 files).
- Designate a password required for access to the document.
- Create a backup document.

For more information on each command, see **File Save command** and **File Save As command.**

Note You can also use the File Save Workspace command to save all your documents and their sizes and positions. For information on workspace files, see **File Save Workspace command.**

Guidelines for Naming Documents

To name documents in Microsoft Excel, you follow the same basic rules that you use when naming files for the Macintosh. These rules are listed below, along with additional guidelines and information you need for naming Microsoft Excel documents:

- **Length of document name:** A document name can be a maximum of 31 characters long. You can use any name you like within this character limit.
- **Capitalization:** A document name can use any combination of upper-case and lowercase letters. To Microsoft Excel, the document name "CDSALES" is identical to the document name "cdsales."
- **Valid characters:** A document name can be any combination of letters (A–Z), numbers (0–9), spaces, or the following characters:
  $ & % ' ( ) - @ ^ { } ~ ` ! _
- **Microsoft Excel icon:** Microsoft Excel assigns an icon to a stored file depending on whether the file contains a worksheet, macro sheet or chart:

Document type	Microsoft Excel icon
Worksheet	Worksheet1

Document type	Microsoft Excel icon
Chart	Chart1
Macro sheet	Macro1
Workspace file	Resume Excel

- **Saving to a different drive/folder:** The folder name above the list box for the File Save As command (and the File Save command, if you choose it before first saving a document with File Save As) indicates the active folder. To save a document to a folder other than the active one, click the folder name to display the names of other folders, then drag to select a folder. Keep selecting folders until you find the desired one. Then type a name for your document and click the Save button.

Saving a New Document

1. Choose File Save As.
   Microsoft Excel proposes a name (for example, Worksheet1) in the text box within the dialog box.
2. In the text box, type a name for the document if you want a different name from the one proposed.
   For more information, see the guidelines discussed earlier in this topic.
3. Click the OK button.

Saving an Existing Document

To save changes to an existing document you have already named:

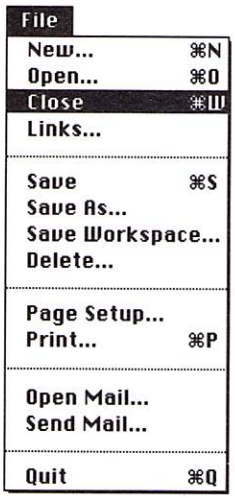
- Choose File Save.

If you want to rename a document later, save it with the File Save As command and type a new filename in the text box.

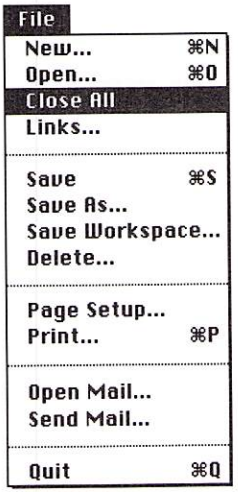
Note If you are working with linked documents, be sure to save supporting worksheets before you save a dependent worksheet or chart, so that external references in the dependent document are current. For more information about saving linked documents, see **Linking documents.**

Procedures for Closing Documents

Closing a document means closing the window or the multiple windows displaying the document and removing the document from the workspace. The commands for closing documents are on these menus (full menus shown):



- Use File Close to close all of the document's windows.



- When you press Shift and select the File menu, File Close becomes File Close All. You can choose File Close All to close all open documents.

You can also close a window by clicking the close box in the left corner of the document title bar.

Any time you close a document before saving changes, Microsoft Excel asks if you want to save changes. Click Yes to save changes, or No if you don't want to save changes. Click Cancel to leave the document open.

For more information, see **File Close command.**

Closing a Document Window

To close all windows into a document:

- Choose File Close.

Closing All Open Documents

1. Hold down Shift and select the File menu.
   This displays the File Close All command instead of the File Close command.
2. Choose File Close All.

Related Information

Reference

For information on	See
Startup procedures	Starting Microsoft Excel Opening a document
Ending a Microsoft Excel session	Quitting Microsoft Excel
Protecting or hiding data in worksheets, macro sheets, and charts	Protecting or hiding data
Printing worksheets, charts, and macro sheets	Printing a document
File conversion between Microsoft Excel and Lotus 1-2-3	Lotus 1-2-3

Scatter chart

A **scatter chart** shows the relationship or degree of relationship between the numeric values in different groups of data. Scatter charts are good analytical tools for exploring what trends, correlations, or patterns — if any — exist in your data. For example, you can use a scatter chart to discover whether the variables in one data series are dependent on or affect those in another. Scatter charts are also useful for:

- Analyzing data series in which categories do not increase or decrease by a constant amount or factor
- Analyzing scientific data

This topic explains:

- Special requirements for scatter charts
- Plotting a scatter chart

Special Requirements for Scatter Charts

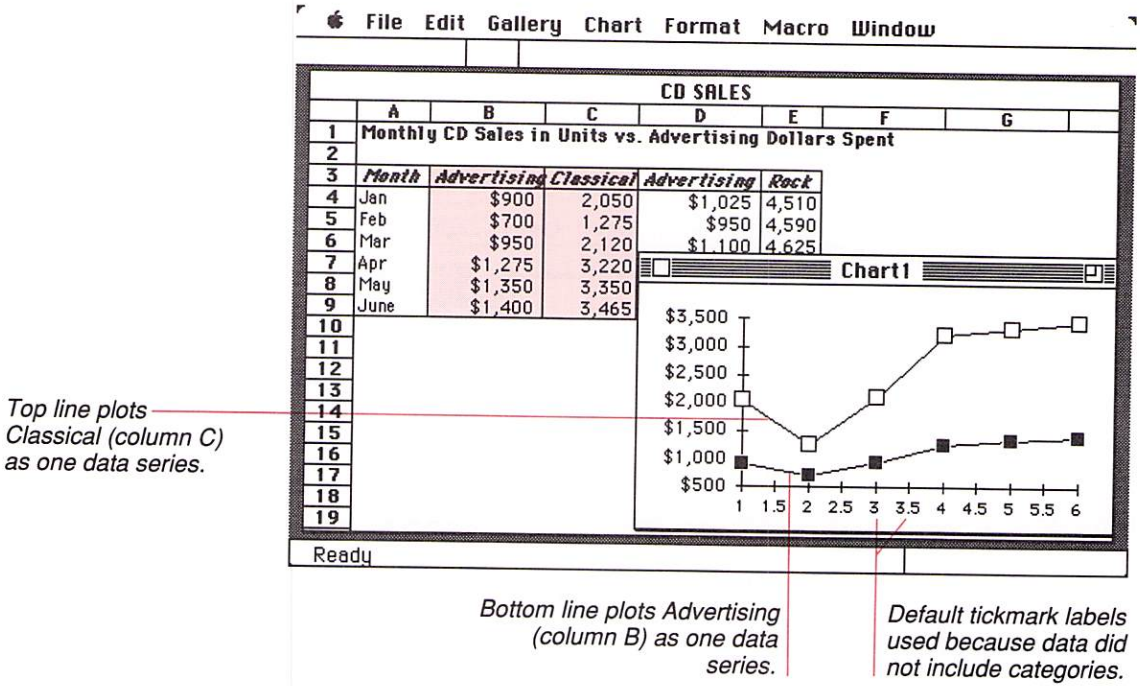
Scatter charts have different requirements from other types of charts that plot data against two axes. Area, bar, column, and line charts plot data as values and discrete categories taken from data series, using one axis for values and one axis for categories.

A scatter chart shows the relationship between only the numeric values in data — typically, between just two groups of data. This type of chart uses numeric values along both axes — numeric values from one group along the horizontal axis, and numeric values from the other group along the vertical axis. The final scatter chart shows how the two groups of data are related by plotting as an x-y coordinate the point at which each x-value intersects with a corresponding y-value. You can then analyze the way the plotted points appear on the chart. The more the points cluster together or reveal a definite visual pattern, the greater the possible correlations between the sets of values.

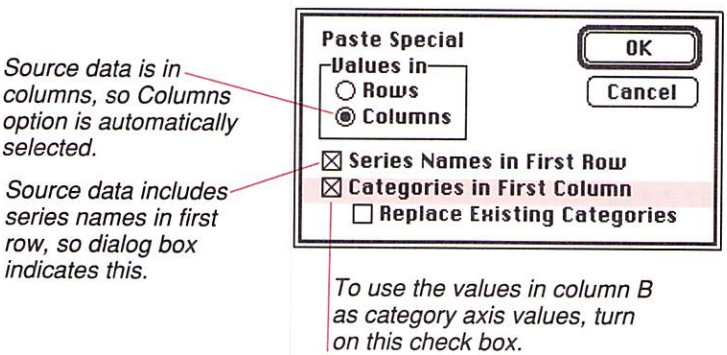
Tip You can think of x-values in a scatter chart as categories (which are always numeric) in a data series, and y-values as the numeric values in a data series.

To create a scatter chart correctly, you need to control the plotting so that both axes show numeric values. The following illustrations explain the adjustment you make to correctly plot scatter charts, and demonstrate one typical use of such charts. The illustrations use two scatter charts to analyze the degree to which money spent on advertising affects sales. The purpose of the charts is to explore whether or not correlations exist between the number of classical and rock music CDs sold and the amount of advertising dollars spent promoting each type of CD.

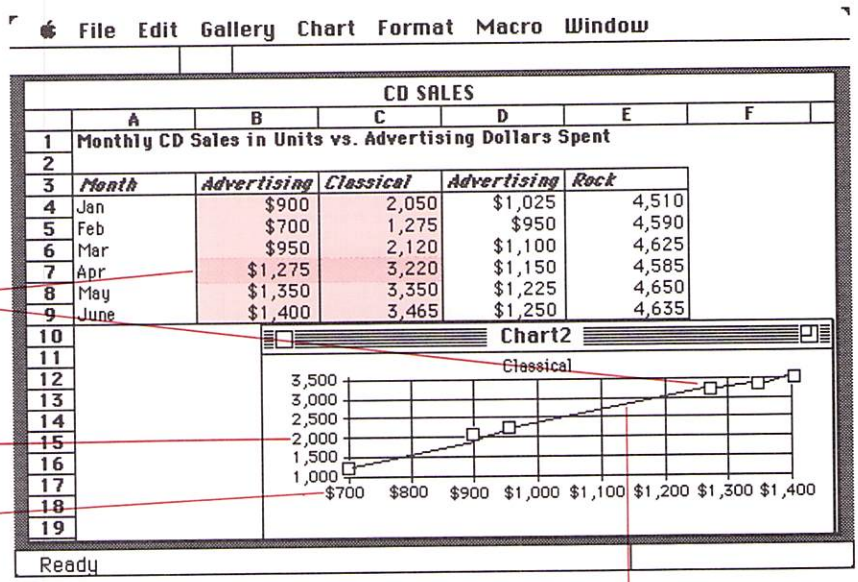
The tinted area on the CDSALES worksheet in the following illustration shows the source data for a scatter chart analyzing advertising dollars and classical CD sales. Selecting this data, creating a new chart with the File New command, and then changing the chart type with the Gallery Scatter command produces Chart1. Notice that Chart1 is not an accurate scatter chart. This chart plots the worksheet data as two separate data series and doesn't show the correlations between the values themselves.


File Edit Gallery Chart Format Macro Window
CD SALES
Monthly CD Sales in Units vs. Advertising Dollars Spent
Month Advertising Classical Advertising Rock
Jan $900 2,050 $1,025 4,510
Feb $700 1,275 $950 4,590
Mar $950 2,120 $1,100 4,625
Apr $1,275 3,220
May $1,350 3,350
June $1,400 3,465
Chart1
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6
Ready
Top line plots Classical (column C) as one data series.
Bottom line plots Advertising (column B) as one data series.
Default tickmark labels used because data did not include categories.

To plot the chart correctly, use the contents in cells B4:B9 as the basis of the horizontal (category) axis values. As a first step, you select the data (tinted) and choose the Edit Copy command. Then you create a new chart with the File New command. To plot the chart, you choose the Edit Paste Special command (full menus) which displays the following dialog box:


Paste Special
OK
Values in
Rows
Columns
Cancel
Series Names in First Row
Categories in First Column
Replace Existing Categories
Source data is in columns, so Columns option is automatically selected.
Source data includes series names in first row, so dialog box indicates this.
To use the values in column B as category axis values, turn on this check box.

The steps in this example produce Chart2, an accurate scatter chart that shows the correlations in the source data. Chart2 correctly plots the data as x-y coordinates. As you can see in the following illustration, each point in Chart2 is a coordinate that represents the intersection of an advertising dollar value and a units-sold value:


File Edit Gallery Chart Format Macro Window
CD SALES
Monthly CD Sales in Units vs. Advertising Dollars Spent
Month | Advertising | Classical | Advertising | Rock
Jan | $900 | 2,050 | $1,025 | 4,510
Feb | $700 | 1,275 | $950 | 4,590
Mar | $950 | 2,120 | $1,100 | 4,625
Apr | $1,275 | 3,220 | $1,150 | 4,585
May | $1,350 | 3,350 | $1,225 | 4,650
June | $1,400 | 3,465 | $1,250 | 4,635
Chart2
Classical
3,500
3,000
2,500
2,000
1,500
1,000
$700 $800 $900 $1,000 $1,100 $1,200 $1,300 $1,400
Ready

Each data point represents an intersection of an advertising dollar and a units sold value.

Vertical axis values from Classical column

Horizontal axis values from Advertising column

Note the visible trend in the data, indicating a fairly high degree of correlation between the groups of values.

Chart2 shows some correlation between advertising dollars spent and sales — for classical CDs.

Plotting a Scatter Chart
(Full Menus)

1. Select the data you want to plot.
2. Choose Edit Copy.
3. Choose File New.
4. Click Chart to open a blank chart window.
5. Click the OK button.
6. Choose Edit Paste Special.

7. If the worksheet data is in columns, turn on the check box for Categories in the First Column.

   If the worksheet data is in rows, turn on the check box for Categories in the First Row.
8. Click the OK button.
9. Choose Gallery Scatter.
10. Select the scatter chart format you want.

Note If your data points extend over a wide range, you may want to choose format 4 or 5, which have logarithmic scales. Logarithmic scales are most useful for plotting widely divergent data because they spread out the lower values while keeping the higher values within the plot area.

11. Click the OK button.

Related Information

Reference

For information on	See
Chart basics	Chart
Formatting and adjusting chart axes; adding gridlines	Chart axis
Microsoft Excel defaults for plotting charts; controlling how data series are plotted	Chart data series
Creating or modifying data series	Series formula

Sampler

Changing Coordinate Systems

Selection

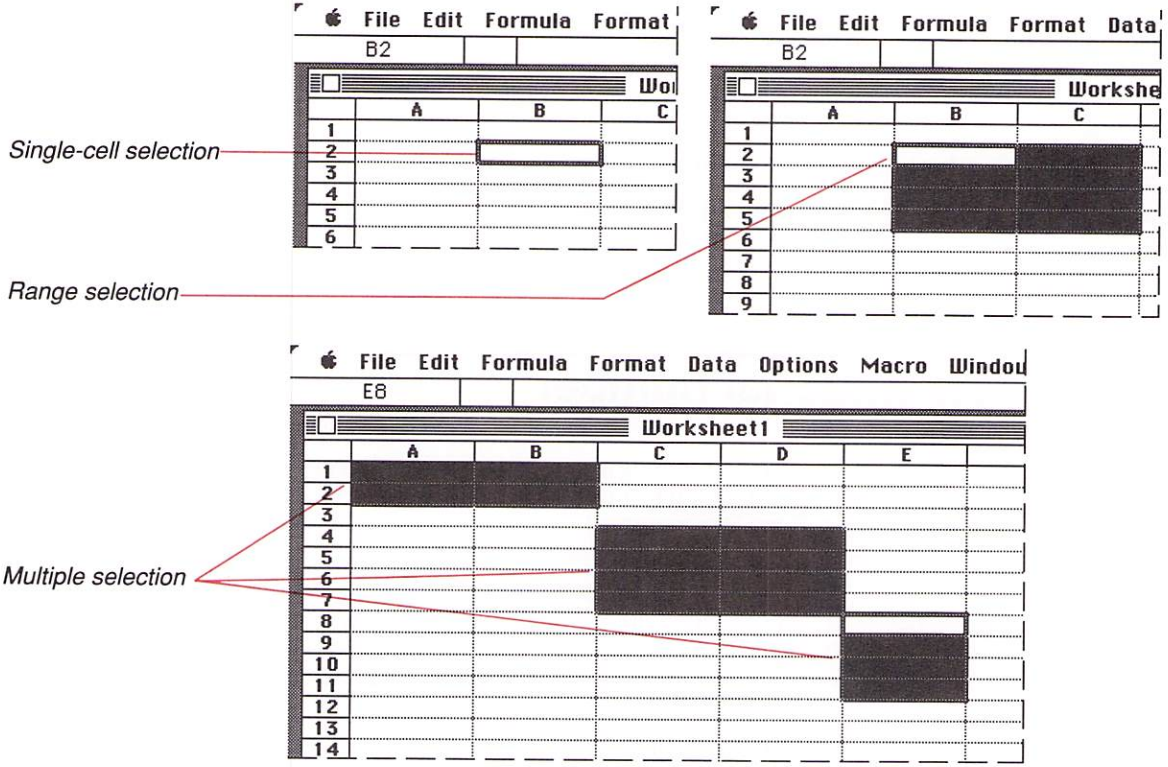
A **selection** consists of the highlighted item on your screen that will be affected by the next command or action. Before carrying out most commands and tasks in Microsoft Excel, you first select the part of the worksheet or chart with which you want to work.

- **Worksheet selections.** In a worksheet, the selection can be a cell, range, or characters in the formula bar. A worksheet selection is usually highlighted — the active cell with a heavy dotted border, and any other selected cells with reverse-video. Selected characters in the formula bar also appear in reverse-video.
- **Chart selections.** In a chart, the selection can be a chart object or chart text. A chart object or piece of chart text that can be formatted with commands or moved and sized directly with the mouse or keyboard is marked with black selection squares. An object or piece of chart text that cannot be moved or sized directly is marked with white selection squares.

This topic describes general procedures for basic worksheet selections. For information on moving and selecting in the formula bar, see **Worksheet.** For information on moving and selecting in a chart, see **Chart.**

Types of Worksheet Selections

You can make three kinds of worksheet selections: a single cell, range, and multiple selection. The following illustrations show an example of each type of selection.



Single cell — a one-cell selection, consisting of the active cell.

- Click the cell you want to select.

Range — a rectangular section of a worksheet containing two or more cells.

- Drag through the cells you want.

Tip To select the entire worksheet as a range, click the square on the worksheet directly above the row numbers.

Multiple selection — any combination of single cells or ranges of cells.

- Select the first cell or drag through the first range, then hold down Command as you click each additional cell or drag through each range.

Related Information

Reference

For information on	See
Selecting cells and ranges with the keyboard	Keyboard

Serial number

A **serial number** is a number Microsoft Excel uses to store a date or time. The integer number (to the left of the decimal point) represents the date. The fractional part (to the right of the decimal point) represents the time of day.

The numbers from 0 to 49710 represent the dates from January 1, 1904 to February 6, 2040 — one number for each consecutive day. The decimal fractions from 0.0 to 0.999 represent the times of day from 00:00:00 (hours:minutes:seconds) or 12:00 A.M. (midnight), to 23:59:59 or 11:59 P.M.

Because Microsoft Excel uses serial numbers, you can perform calculations with dates and times. For example, you could store a start time and a stop time in two cells. Then, in a third cell, you could build a formula that finds the elapsed time by calculating the difference between the first two cells. Change the number format of the cell containing the results to a time format to display the result as a time.

You can enter dates or times by typing them in any of the Microsoft Excel date or time formats, or by using the DATE or TIME function. For more information about entering and formatting dates and times, see **Date** and **Time.** For more information about using functions, see *Microsoft Excel Functions and Macros.*

Series formula

A **series formula** consists of the information Microsoft Excel uses to plot a data series (one set of related worksheet values organized by categories) in a chart. The formula usually includes references to worksheet cells (or named ranges) that provide value and category names, as well as the plotting order of the data series. Microsoft Excel creates one series formula for each data series.

This topic explains:

- Overview of series formulas

  Parts of a series formula

- Working with series formulas

  Editing a series formula

  Building a series formula

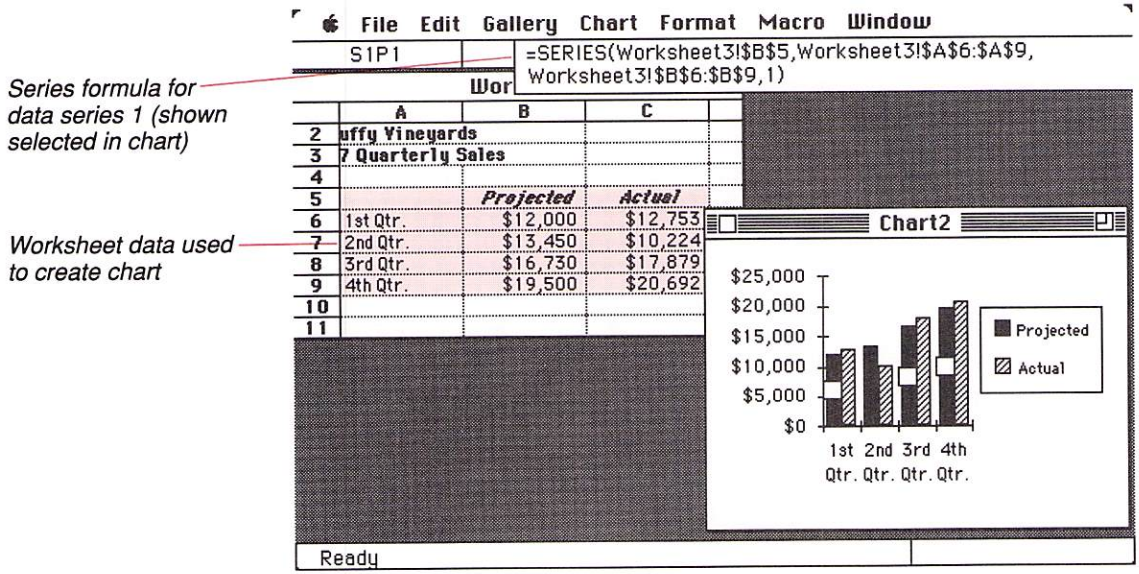
Note A chart data series is different from the type of series you create with the Data Series command. You use the Data Series command in a worksheet to enter a row or column of dates or numbers that increase by a constant amount or factor. For more information, see **Data Series command.**

Overview of Series Formulas

Understanding series formulas is useful for the following charting tasks:

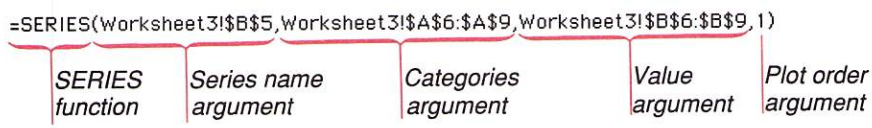
- Editing a series formula to change data series names in a chart legend or to control how data series are plotted in a chart
- Building a series formula to add a data series to a chart or to create a new chart from "scratch"
- Deleting a data series from a chart by deleting its series formula in the formula bar

A series formula is displayed in the formula bar any time you select a data series marker in the chart. The following example shows a chart and its source data in a worksheet. The series formula for the selected data series is displayed in the formula bar.



Parts of a Series Formula

Here's a closer look at the series formula shown in the previous section:



A series formula consists of the SERIES function, followed by its four arguments, each of which defines one aspect of the data series. A series formula must contain the following parts, in this sequence:

- **SERIES function** — must be preceded by an equal sign and immediately followed by a left parenthesis to mark the beginning of the arguments.
- **Series name argument** — can be an external reference to a single cell or a name defined to be a single cell or a sequence of characters. The argument is immediately followed by a comma. The series name argument can also be text, enclosed in quotation marks (for example: "*Mortgage*",). This argument provides the series name for a chart legend if you add one.

- **Categories argument** — can be an external reference to the worksheet name and cells that contain your categories, followed by a comma. You can substitute a named range or an array constant for the cell references. You can also type the categories argument into a series formula directly.
- **Values argument** — can be an external reference to the worksheet name and the cells that contain your values, followed by a comma. You can substitute a named range or an array constant for the cell references. You can also type the values argument into a series formula directly.
- **Plot order argument** — must be an integer (1, 2, 3...), followed by a right parenthesis (to mark the end of the formula). This argument defines the plotting order for the data series in the chart.

Tip If you plan on changing the supporting worksheet, it's a good idea to use names in both the worksheet and the chart. Even if you insert or delete columns in the worksheet, using names in external references ensures that your chart will always refer to the data you originally selected to create the chart. For more information, see **Names.**

If you change a worksheet value that provides data to a chart, the series formula is recalculated and Microsoft Excel redraws the chart to reflect the change.

A series formula typically uses external references to categories and values on a specific worksheet. An external reference in a chart formula consists of the name of the source worksheet, followed by an exclamation point (!) and the absolute reference of the worksheet range referred to. External names (named cells and ranges) can substitute for the absolute references. The same rules that apply to external references between linked worksheets apply to external references between a chart and worksheet.

For information on external references, see **Linking documents.**

Working with Series Formulas

When you create a new chart with the File New command, or when you add data series by copying and pasting, Microsoft Excel automatically builds a series formula for each data series, using the worksheet data you selected. You can edit existing series formulas and you can build series formulas from "scratch."

Editing a Series Formula

You can edit an existing series formula to:

- Change a data series name as it appears in a chart legend (edit the series name argument)
- Change the references for categories or values (edit the categories or values arguments)
- Alter the plotting order of data series — useful for working with overlay charts (edit the plot order argument)
- Delete a data series from a chart (select the data series and delete its series formula in the formula bar)

To edit a series formula:

1. Click a marker from the data series to display the series formula you want to edit.
2. Edit the formula, using standard procedures for editing in the formula bar.
3. When you finish editing the formula, press Enter or click the enter box.

   Microsoft Excel redraws the chart to reflect the changes you made.

For more information on editing in the formula bar, see **Formula bar.** For more information on how to delete a data series, see **Chart data series.**

Building a Series Formula

You can build a series formula to:

- Add a data series to an existing chart
- Create a new chart based on worksheet data (as an alternate method to selecting worksheet data and using the File New command) or to create a chart that is not linked to any worksheet data

By building the formula yourself, you can control the plotting of the data and the data series name. You can type the series formula, including the appropriate arguments. You can also build the series formula by typing and selecting cells on a worksheet, as described in the following procedure.

Tip Before you build a series formula, you might find it helpful to use the Window Arrange All command so you can see both your worksheet and your chart on your screen at the same time.

1. Open a blank chart window first.

   Make sure that a blank worksheet cell is selected, choose the File New command, and click Chart.
2. To start the formula, type *=series(*
3. If you want the data series name linked to the worksheet, select the cell on the worksheet that contains the text you want for the data series name, then type a comma. This enters the external reference in the formula.

   If you don't want the data series name linked to a worksheet cell, type a data series name enclosed in quotation marks and followed by a comma. You can also leave out the data series name and type just the comma.
4. Select the area on the worksheet that contains the data you want to use as categories, and type a comma. The reference appears in the formula.

   You can also type an absolute reference, a name, or an array constant, followed by a comma. If you don't want a categories reference, type just the comma.
5. Select the area on the worksheet that contains the data you want to use as values, then type a comma.

   You can also type an absolute reference, a name, or an array constant, followed by a comma.
6. Type the plot order number you want the data series to have, followed by a right parenthesis to finish the formula.

   If you type the plot order number of an existing data series, Microsoft Excel renumbers the existing data series appropriately. If you leave out the plot order number, Microsoft Excel plots the data series last, after any existing data series, and supplies the plot order number.
7. Press Enter or click the enter box.

   Microsoft Excel adds the data series to the chart.

For more information on formulas, see **Formula.** For other ways to add a data series to a chart, see **Chart data series.**

Related Information

Reference

For information on	See
Chart basics	Chart
Working with chart legends	Chart legend
Entering and editing formulas	Formula Formula bar
An overview of functions	Function

Sorting data

To reorganize data on a worksheet, use the Data Sort command. You can sort rows or columns in any rectangular block of cells.

This topic explains:

- Sorting
- Undoing a sort
- Using more than three keys

Sorting

You can sort by rows or columns.

If you sort by rows, you can sort based on the values in up to three key columns in a single sort. If you sort by columns, you can sort based on the values in up to three key rows.

Microsoft Excel sorts in either ascending or descending order. You specify ascending or descending order for each key column or row. In ascending order, Microsoft Excel sorts in the following order, top to bottom or left to right:

- Numbers
- Text
- Logical values
- Error values
- Blanks

In ascending order, numbers are sorted from the largest negative number to the largest positive number. Text is sorted in the following order:

Space ! " # $ % & ' ( ) * + , - . / 0
1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B
C D E F G H I J K L M N O P Q R S T
U V W X Y Z [\ ] ^ _ ` { | } ~

The numbers in the text sort order refer to numbers that are typed on the worksheet as text values. Numbers that appear on the worksheet as number values are sorted separately. Microsoft Excel ignores case when sorting text. Uppercase letters and lowercase letters are equal.

The logical value FALSE is sorted before TRUE. All error values are equal.

In descending order, Microsoft Excel reverses the order of everything except blank cells, which are always sorted last.

To sort:

1. Select the range you want to sort.
   Everything within that range will be reordered, based on the key rows or columns you specify. Nothing outside of that range will be affected by the sort.
2. Choose Data Sort.
3. To sort rows (reorder rows keeping rows intact), click Rows.
   To sort columns (reorder columns keeping columns intact), click Columns.
4. Enter the reference of your first key in the 1st Key box.
   If you are sorting by rows, this can be the reference of any cell in the column you want to use as your first key column. If you are sorting by columns, this can be the reference of any cell in the row you want to use as your first key row.
5. To sort by more than one key, insert references in the 2nd Key and 3rd Key boxes.
6. Click Ascending or Descending order, for each key you specify.
7. Click the OK button.

Note If you are sorting a database, be careful not to select your field name row. If you select the field name row, it is sorted with the rest of your database.

Undoing a Sort

If you don't like the way your data was sorted, you can undo the sort immediately after you sort.

- Choose Edit Undo.

Using More Than Three Keys

You can sort based on more than three keys; you just need to use Data Sort more than once.

1. Sort using the three least important keys. Of those three keys, use the most important as the first key, the next as the second key, and the least important as the third key.
2. Sort using the next three keys, again using the most important of the three as the first key.
3. Continue sorting in this manner until you have sorted using the most important keys.

Related Information

Reference

For information on	See
Databases	Database

Starting Microsoft Excel

Before you start Microsoft Excel for the first time, make sure you've installed Microsoft Excel properly and set up the other devices you want to use with the program, such as printers or plotters. For information on installing Microsoft Excel, see *Getting Started with Microsoft Excel.*

When you start Microsoft Excel, the default settings apply to any new document you create until you change those settings. When you save a document, Microsoft Excel stores any changes to defaults along with the document. Your settings for the document take effect whenever you open and activate the document. For information on Microsoft Excel defaults, see **Default settings.** For information on opening new or existing documents, see **Opening a document.**

Starting Microsoft Excel

1. Turn on your computer.
2. If necessary, open the folder in which you have installed Microsoft Excel.
3. Double click the Microsoft Excel icon.

You can also start Microsoft Excel by double clicking any icon associated with a worksheet, chart, macro sheet, or workspace file stored on your disk.

Related Information

Reference

For information on	See
Automatically opening a file when you start Microsoft Excel	Startup file
Creating new documents and opening existing documents	Opening a document
Setting up page layout and printing documents	Headers and footers Printing a document
Saving documents	Saving and closing a document
Ending a session with Microsoft Excel	Quitting Microsoft Excel

Getting Started with Microsoft Excel

Installing Microsoft Excel

Startup file

You can specify a file that you want Microsoft Excel to open each time it starts. This startup file can be any regular Microsoft Excel file: worksheet, chart, macro sheet, or workspace file.

1. Create the file you want Microsoft Excel to open automatically each time it starts.
2. Name the file Excel Startup.
3. Copy the file Excel Startup into your System folder.

Now, each time you start Microsoft Excel, the Excel Startup file is automatically opened.

To cancel your startup file, you can do one of three things:

- Change the name of your startup file to something other than Excel Startup
- Move the Excel Startup file to another folder
- Drag the Excel Startup file to the trash

Related Information

Reference

For information on	See
Default settings for Microsoft Excel	Default settings
Starting Microsoft Excel	Starting Microsoft Excel
Workspace files	Workspace file

Status bar

The **status bar** is an area at the bottom of the Microsoft Excel window that displays information about the current activity or mode of Microsoft Excel.

This topic discusses:

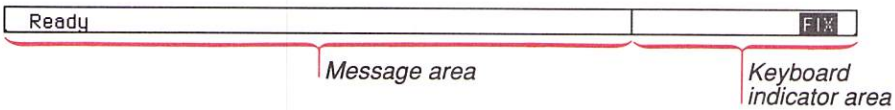
- The parts of the status bar
- The message area
- The keyboard indicator area
- Hiding or displaying the status bar

The Parts of the Status Bar

The status bar is divided into two parts:

- The **message area** displays information about commands and dialog boxes, and other processing information.
- The **keyboard indicator area** gives information such as whether the Num Lock key is turned on.

Here's a close-up view of the parts of the status bar:



The Message Area

Microsoft Excel displays several kinds of messages in the message area at the left side of the status bar. When a command is selected, the message consists of a brief explanation of the selected command. When a dialog box or message is displayed in the workspace, the status bar message tells you how to get help.

Other messages displayed in this area of the status bar serve as reminders of the current mode of Microsoft Excel, as indicators of a special operation in progress (such as copying cells or recording a macro), or as messages for special conditions that apply to the active document (such as a circular reference). The following table lists these messages:

Message	Meaning
Calculate	Calculation is set to manual, and the worksheet has been changed since the last time it was calculated. To ensure correct totals, choose Options Calculate Now to calculate the worksheet.
Circular: *reference*	Microsoft Excel has found a circular reference in the worksheet. The specific cell reference following the word "Circular" indicates one of the cells involved in the circular reference.

Copy (Select destination and press Enter or choose Paste)	A worksheet or chart copy operation within Microsoft Excel is in progress. Once you select the destination area on a chart or worksheet, pressing Enter or choosing the Edit Paste command inserts the copied data.
Cut (Select destination and press Enter or choose Paste)	Worksheet cells are selected for moving with the Edit Cut command. Once you select the destination area, pressing Enter or choosing the Edit Paste command inserts the moved data.
Edit	Microsoft Excel is in Edit mode, used for editing the contents of the active cell in the formula bar.
Enter	Microsoft Excel is in Enter mode, used for basic data entry in the active cell.
Find (Use Direction keys to view records)	Microsoft Excel is in Data Find mode, used for finding and selecting database records that meet specified criteria.
Help (To specify a topic, choose a command or click a screen region)	A Help request is in progress. Choosing a command displays a Help topic for that command rather than displaying the dialog box or carrying out the command. Clicking a screen region displays the Help topic for that screen region.
Point	Microsoft Excel is in Point mode, used for entering cell and range references in a formula in the active cell.
Ready	Microsoft Excel is in Ready mode, waiting for you to select cells, activate the formula bar and enter or edit data, or choose commands.
Recording	The macro recorder is turned on with the Macro Record command.

For a list of topics related to the messages in the preceding table, see "Related Information," later in this topic.

Note You can create macros to display your own messages in the status bar. For more information, see Chapter 3, "Introduction to Macros," in *Microsoft Excel Functions and Macros*.

The Keyboard Indicator Area

The keyboard indicator area on the right side of the status bar displays information about standard keys on your keyboard (such as Num Lock) and special-purpose keys defined in Microsoft Excel (such as the Extend key).

The following table lists these indicators and their meanings:

Indicator	Meaning
EXT	The Extend key (F8) is turned on. With the keyboard, you can extend a selection without using Shift.
FIX	The Fixed Decimal option (Options Workspace command), a keyboard-related setting, is turned on. This option sets up fixed decimals as on a 10-key adding machine, so that in any number you enter, decimal points are automatically inserted for the number of decimal places you specify.
NUM	Num Lock is turned on.

Note If you enter fixed decimal numbers with the regular number keys at the top of the keyboard, use the Fixed Decimal option alone. If you enter fixed decimal numbers with the numeric keypad (located on the right side of most keyboards), be sure to turn on Num Lock as well. The status bar will display both the FIX and NUM indicators.

For more information, see **Keyboard.**

Hiding or Displaying the Status Bar (Full Menus)

When you start Microsoft Excel the first time, the status bar is displayed. If you want a little extra room in the workspace, you can hide the status bar.

To hide the status bar	To display the status bar
1 Choose Options Workspace. 2 Turn off the Status Bar check box. 3 Click the OK button.	1 Choose Options Workspace. 2 Turn on the Status Bar check box. 3 Click the OK button.

Related Information

Reference

For information on	See
Ready, Enter, Point, and Edit modes	Worksheet
Data Find	Database
Help	Help
Copying and moving cells and data	Copying data and formats Moving data on a worksheet
Splitting a window into panes	Windows
Additional display formats	Display options
Recording a macro	Macro

Table

A **table** is a range of cells whose values provide input for other formulas on a worksheet. Microsoft Excel has two different types of tables:

- A **data table** is used for testing the effect of "what-if" values using either one or two inputs. For more information, see **Data table.**
- A **lookup table** provides data that you retrieve based on the comparison of a value you specify with values in the table. For more information, see **Lookup table.**

Text

On a worksheet, **text** is any set of characters entered in a cell that Microsoft Excel does not interpret as a formula, number, date, time, logical value, or error value. As with constant numbers, Microsoft Excel does not change text unless you select the cell containing the text and edit it.

You can also enter text in formulas and on charts. In charts, the various labels that can be displayed are considered text. Within formulas, text includes those characters enclosed in double quotation marks (" ").

For information on how to work with text in a chart, see **Chart, Chart text,** and **Format Text command.**

Entering Text

To enter text as a constant, you select a cell and type the text. What you type appears in the formula bar and is entered into the active cell when you press Enter or click the enter box. Text may contain letters, digits, and other special characters which you can produce on your printer. A cell can hold up to 255 characters of text.

If text is too long to fit in a cell, Microsoft Excel extends the display of text into the neighboring cells until it encounters a cell that is not empty. However, all the text is stored in the first cell. Microsoft Excel stores all the text that was entered regardless of how much text is displayed. To increase or decrease the amount of text displayed in a cell, change the width of the column. For more information on changing column width, see **Column.** To distribute long strings of text evenly throughout a block of selected cells, use the Format Justify command. For step-by-step instructions, see **Alignment.**

If you want Microsoft Excel to interpret numbers as text, type the numbers within double quotation marks. If you type *="36419"*, Microsoft Excel interprets this as the text 36419, not as the number 36419.

When you use text in a formula, be sure to include both the double quotation marks and the equal sign. Without the double quotation marks, Microsoft Excel interprets the text as a name or number. If you want to include quotation marks within the text, type two double quotation marks for each double quotation mark that you want to appear. For example, to enter the text *a"b"c* in a formula, type *="a""b""c"*

Related Information

Reference

For information on	See
Editing text	Formula bar Editing a document
Formatting text (general overview)	Formatting a document
Constant values	Constant value
Editing in documents (general overview)	Editing a document
Fonts	Font
Aligning text	Alignment
Justifying text	Alignment Format Justify command
Text in charts	Chart Chart text

Time

You can use several built-in time formats or create custom time formats for use in your Microsoft Excel documents.

This topic explains:

- How Microsoft Excel stores times
- Built-in time formats

  Formatting times as you type
  Trouble-shooting time formats you type
  Using the Format Number command to assign time formats

- Custom time formats

  Creating a custom time format
  Using a custom time format
  Deleting a custom time format

Note All worksheet time formats also apply to macro sheets.

How Microsoft Excel Stores Times

Microsoft Excel stores all times as decimal fractions. These fractions represent the portions of a day elapsed between a given time and 12 midnight, the beginning of the day. For example, the value 0.5 represents 12 noon — 12/24 or 1/2 of a day. The value 0.75 is equal to 6 P.M. — 18/24 or 3/4 of a day. Microsoft Excel has several built-in formats you can use to display a time.

Note Microsoft Excel stores dates as serial numbers running from 0 to 49710, where 0 is the number for January 1, 1904, and 49710 is the number for February 6, 2040. For example, the serial number for 6/1/85 is 29737. To represent a specific date/time combination, Microsoft Excel stores the serial number for the date and a decimal fraction for the time. For example, 29737.5 represents 12 noon on 6/1/85. For more information on date formats, see **Date.**

With times stored as decimal fractions, you can perform calculations using times as you would other numbers. For example, using normal time formats, you can enter the starting time of an experiment in one cell and the ending time in another cell. In a third cell you can enter a formula which subtracts the starting time from the ending time to calculate elapsed time. Microsoft Excel uses the decimal fraction equivalents for the times to calculate the formula. You can choose to display the resulting value in time format or decimal number format.

Built-in Time Formats

In Microsoft Excel you can use the following built-in time formats:

Format	Example
h:mm AM/PM	4:48 AM
h:mm:ss AM/PM	4:48:20 PM
h:mm	16:48
h:mm:ss	16:48:45
m/d/yy h:mm	4/30/87 22:45

There are two ways to apply a built-in time format in a worksheet:

- **Format the time as you type** — You can type a time using one of the built-in formats in the preceding table; Microsoft Excel stores the decimal fraction and, if the cell is formatted as General, assigns the time format to the cell.
- **Assign a built-in time format with the Format Number command** — You can assign any built-in time format to a cell or range with the Format Number command before or after you type the data.

Note Microsoft Excel also has several built-in worksheet functions for manipulating times, dates, and serial numbers. For more information, see *Microsoft Excel Functions and Macros.*

Formatting Times as You Type

Microsoft Excel displays a time format as close as possible to what you type. If you type a time into a cell formatted in General format or one of the built-in time formats, Microsoft Excel stores the decimal fraction (and serial number if you specify a particular date and time) and displays it as a time. For example, when you type *6:00 PM* in a cell with General format, Microsoft Excel stores the time as the decimal fraction 0.75, and assigns the format h:mm AM/PM for displaying the time.

You can also type times in formats other than the built-in choices. Type the time format as you want it, following these guidelines:

- **Indicating the 24-hour clock** — Unless you type *AM* or *PM,* Microsoft Excel automatically displays time using the 24-hour clock (military time).
- **Indicating the 12-hour clock** — If you want to display time using the 12-hour clock, type *AM* or *PM.* You can also type *A* or *P* instead of *AM* or *PM,* but you must include a space between the time and the letter.
- **Date and time** — You can type a date and a time in the same cell. You must separate the date and time by a space. For example, you could type *4/23/86 16:48* or *4:48 PM Apr-86*
- **Capitalization** — You can type either uppercase or lowercase letters in time formats. Microsoft Excel ignores capitalization when you enter times.

Trouble-shooting Time Formats You Type

Microsoft Excel displays non-built-in time formats as precisely as possible, but in some cases, it may interpret your formats slightly differently than you intended. Use the following trouble-shooting guidelines if you're unsure about how Microsoft Excel is interpreting non-built-in time formats you type:

- **Month name and single or double digit** — Microsoft Excel interprets a month name followed by a single or double digit to be a month and a year. For example, if you type *February 4 23:45,* Microsoft Excel interprets it as 2/1/04 23:45, not February 4th 23:45. If you type *Feb-13 17:30* Microsoft Excel interprets it as 2/1/13 17:30.
- **Typing times in previously formatted cells** — If you type a time into a cell with neither the General format nor a time format, Microsoft Excel converts the time to a decimal fraction, but displays the value in the cell's format. For example, if you type *6:00 PM* in a cell formatted to display dollar values, Microsoft Excel stores the decimal fraction for the time, 0.75, and displays it as $1 (0.75 rounded off to 1). To correctly display the number as a time, choose the Format Number command and select the time format you want.
- **Time formats Microsoft Excel does not recognize** — If Microsoft Excel does not recognize a time format you type, it displays the data as precisely as possible, but stores the time as text instead of as a decimal fraction. If you try to use the time in calculations, Microsoft Excel returns the error value #VALUE!. For this reason, you should either use a built-in format or create a custom time format when using times in calculations.
- **Non-existent times** — If you enter a time that does not exist, such as 34:62, Microsoft Excel interprets it as text. If you try to use the time in calculations that expect a number, Microsoft Excel returns the error value #VALUE!.

Tip The formula bar shows how Microsoft Excel interprets a time format you type. Check the formula bar if you have questions about how Microsoft Excel has interpreted the contents of the cell.

Using the Format Number Command to Assign Time Formats

1. Select the cells you want to format.
2. Choose Format Number.
3. In the list box, select a time format.
4. Click the OK button.

Custom Time Formats

You can create your own time formats for specialized uses in Microsoft Excel documents. Using a custom time format can also simplify data entry. For example, you can format a range with a complex custom time format, but enter the data using a simpler format, and Microsoft Excel will display the data in your custom format.

The following table shows the symbols you can use for creating custom time formats. Each time format symbol has its own meaning.

This format symbol	Means this
General	Display the number in General format
h	Display the hour as a number without leading zeros (0–23)
hh	Display the hour as a number with leading zeros (00–23)
m	Display the minutes without leading zeros (0–59)
mm	Display the minutes with leading zeros (00–59)
s	Display the seconds without leading zeros (0–59)
ss	Display the seconds with leading zeros (00–59)
AM/PM am/pm A/P a/p	Display the hour using a 12-hour clock (AM, am, A, or a for times before noon; PM, pm, P, or p for times between noon and midnight); formats without one of these symbols display the hour using the 24-hour clock

Note The m or mm symbol must appear after an h or hh symbol, or Microsoft Excel displays the month instead of the minute. For more information, see **Date.**

Here are some examples of time formats you can create:

If a cell has this format	And you enter	Microsoft Excel displays
hh"h" mm"m"	4:48 PM	16h 48m
h.mm AM/PM	16:48	4.48 PM
hhmm "hours"	2:00	0200 hours

Note Enclose characters you want to appear as literal parts of a custom format in quotation marks, as in the first example in the preceding table.

Creating a Custom Time Format

You can create a custom time format in two ways:

- **Edit a built-in time format in the Format Number dialog box.** You can create a custom format similar to one that already exists by editing a built-in format in the list box. Use the time format symbols shown in the table earlier in this section. When you click the OK button, Microsoft Excel retains both the built-in format and your newly created custom format.
- **Type your own format in the Format Number dialog box.** Using the time format symbols in the table earlier in this section, type the format you want in the Format text box.

To create a custom time format:

1. Select the cells you want to format.
2. Choose Format Number.
3. Select a built-in format from the list and edit it in the Format box. Or, type a new format in the Format box.

   Refer to the guidelines and table earlier in this topic.
4. Click the OK button.

Microsoft Excel formats the selected cells with the new format and adds it to the end of the list box so you can reuse it.

Using a Custom Time Format

1. Select the cells you want to format.
2. Choose Format Number.
3. Scroll to the end of the list box and select the custom format you want.
4. Click the OK button.

Deleting a Custom Time Format

1. Choose Format Number.
2. Scroll to the end of the list box and select the custom format you want to delete.
3. Click the Delete button.
4. Click the OK button.

Note You cannot delete a built-in format.

Related Information

Reference

For information on	See
Worksheet, chart, and database basics	Worksheet Chart Database
Date formats	Date
Using other built-in number and text formats	Number Text
Formatting options (general overview)	Formatting a document

Two-input table

A **two-input table** consists of:

- Two groups of values that are substituted for two variables in one formula.
- The formula results that occur when the two groups of values are substituted for the variables.

Data tables are useful for "what-if" analysis. For more information, see **Data table.**

Values

In a worksheet, a **value** is data contained in a cell. A value can either be data that you type directly into the cell or the result of the formula in that cell.

This topic explains:

- Types of values
- How Microsoft Excel converts values
- Creating a series of dates or numbers
- Parsing imported values

Types of Values

The following table shows the four basic types of values in Microsoft Excel:

Type of value	Examples
Numbers	243, 5.3, 2E+3, 9/16/88, 3:15 PM
Text	Mr. Hansen, Total Costs
Logical	TRUE, FALSE
Error	#NUM!, #VALUE!

Numbers include dates, times, and currency values. For more information, see **Date** and **Time.** For information on numbers and text, see **Number** and **Text.**

Logical values are the values TRUE and FALSE. These are produced by and used in formulas that perform comparisons, such as determining if the number in one cell is larger than a number in another cell. For more information, see **Logical value.**

Error values are values, such as #N/A or #NUM!, that Microsoft Excel displays when it cannot properly calculate a formula. For more information, see **Error value.**

Values are displayed on your worksheet either as the result of a formula or because you directly enter the value into a cell. A value that you enter directly is called a **constant value.** Constant values do not change unless you select that cell and edit the value yourself. A value that is produced as the result of a formula can change when other values in the worksheet change.

How Microsoft Excel Converts Values

Microsoft Excel often expects certain types of values when calculating a worksheet. If you enter something that is different from what Microsoft Excel expects, it tries to convert the value.

Microsoft Excel's ability to convert operands and arguments gives you more flexibility when using formulas. You will rarely have to resort to special functions to convert between types of values.

The following list gives some examples of how Microsoft Excel converts values:

- **Converting to numbers.** In the formula ="1"+"2", the plus sign causes Microsoft Excel to expect numbers. Even though the quotation marks mean that "1" and "2" are text values, Microsoft Excel automatically converts the text to numbers and produces the number 3.

  When Microsoft Excel expects a number, it converts text if the number is in a format that the formula bar would accept for a number constant. For example, it converts the formula =1+"$4.00" and produces the value 5. For the formula =SQRT("Sunday"), Microsoft Excel cannot convert the text to a number because it is not in a format the formula bar accepts for a number constant. It produces the error value #VALUE!.

  Microsoft Excel converts the value FALSE to the number 0, and TRUE to 1.

Because Microsoft Excel can convert text to numbers, you can easily enter serial numbers for dates and times within formulas. You do this by entering into the formula the date formatted in one of the Microsoft Excel date or time formats. For example, in the formula ="6/1/85"−"5/1/85", Microsoft Excel converts the dates to serial numbers and produces the value 31.

- **Converting to text.** When Microsoft Excel expects text, it converts all numbers and logical values to text. For example, it converts the formula ="A="&TRUE to the text value A=TRUE, and the formula ="A="&5 to the text value A=5.
- **Converting to logical values.** When Microsoft Excel expects a logical value, it converts the number 0 to FALSE and other numbers to TRUE. For example, it converts the formula =IF(0,"right","wrong") and produces the value "wrong." When expecting a logical value, Microsoft Excel produces the #VALUE! error value when it encounters any textother than "true" or "false." For example, the formula =IF("true","right","wrong") produces the value "right", but the formula =IF("correct","right","wrong") produces the error value #VALUE!, because "correct" cannot be converted to a logical value.

Creating a Series of Dates or Numbers (Full Menus)

When building a worksheet, you can use the Data Series command to quickly create a series of column or row titles based on incremental time periods or numbers that increase by a constant amount or factor. You specify the starting value, the direction you want to fill (row or column), the increments or factors of increase, and a stop value for the series, if necessary. Microsoft Excel creates the series based on your specifications.

You can create three types of series in Microsoft Excel:

- **Date series.** When you use a date series, you can specify that Microsoft Excel build the series based on increments of days, weekdays, months, or years. For example, if you start a date series with the date Jan-88 and specify increments of months, Microsoft Excel creates the series Jan-88, Feb-88, Mar-88, and so on. Microsoft Excel interprets the dates in a monthly series to be the first day of each month (in this example, Jan 1, 1988, Feb 1, 1988, and so on).
- **Linear series.** When you use a linear series, Microsoft Excel increases values by a constant increment. For example, if you start a linear series with 1 and specify a step value (constant increment) of 2, Microsoft Excel creates the series 1, 3, 5, 7, 9, and so on.

- **Growth series.** When you use a growth series, Microsoft Excel increases values by a constant factor. For example, if you start a growth series with 1 and specify a step value of 2, Microsoft Excel creates the series 1, 2, 4, 8, 16, 32, and so on.

Note A series created with the Data Series command is different from a chart data series. For information on data series used in charts, see **Chart data series.**

To create a series:

1. Enter the starting value for the series in a cell.
2. Select the row or column you want to fill with the series, including the starting value as the first cell in the selection.
3. Choose Data Series.
4. Under Series In, click Rows if you want the series in a row. Click Columns if you want the series in a column.
5. Under Type, click a series type. If you click Date, also specify the Date Unit you want to use.
6. In the Step Value box, type the increment you want to use. If you want Microsoft Excel to stop filling the selection when it reaches a certain value, type that value in the Stop Value box. Otherwise, Microsoft Excel fills the entire selection.
7. Click the OK button.

You can also create several series at once by selecting more than one row or column before choosing the Data Series command. Then, depending on whether you select Rows or Columns in the dialog box, Microsoft Excel creates a series for each row or column in the range.

Tip Growth series are ideal for filling in compounded interest or growth rates. For example, if you want to see how $100 grows each month in a money market account that earns 10% interest, enter $100 as the starting value, select that cell and 12 other cells to fill, and choose Data Series. Select Growth as the series type, type an increment of 100.83% (100% plus 10% divided by 12), and click the OK button. Microsoft Excel will fill the cells with values that show the compounded interest after each month.

For more information, see **Data Series command.**

Parsing Imported Values
(Full Menus)

If you copy data into Microsoft Excel from another application, especially a database program, several columns of data may be condensed into a single column during the transfer. For example, if you open a database report file from another application as a worksheet in Microsoft Excel, each full record is typically placed in a single cell. Use the Data Parse command to separate the fields of each record into separate columns.

The range you parse can be any number of rows long, but only one column wide. The parse settings you create for the first cell in the range apply to all cells in the range.

You create parse settings by adding brackets to the parse line in the Data Parse dialog box. The parse line displays the contents of the first cell in the selection. The Guess button adds a set of brackets and the Clear button clears all brackets.

Whether you add all the brackets yourself or change the brackets added by the Guess button, use the following keys to add or delete brackets in the Parse Line:

To	Press
Move the insertion point	Left Arrow and Right Arrow keys
Delete unwanted brackets	Backspace
Add brackets	Left and right brackets ([and])

Important When you parse the data, Microsoft Excel fills cells to the right of the column you are parsing. If there is data in those cells, that data is lost when the parsed data replaces it. Make sure you have enough blank cells to the right of the range you are parsing to accommodate the data.

To parse data:

1. Select the range of cells containing the data you want to separate. The range must be no more than one column wide.
2. Choose Data Parse.
   The Data Parse dialog box appears, and displays the contents of the first cell in the range. The parse settings you set for the first cell apply to all cells in the range.
3. Click the Guess button.
   Microsoft Excel adds brackets to the parse line. Each set of brackets shows where a field will be separated into a different column.

4. If necessary, change the guess by adding or deleting brackets in the parse line.
5. Click the OK button.

For more information, see **Data Parse command.**

Related Information

Reference

For information on	See
Calculations in Microsoft Excel	Calculation
Calculating with dates and times	Serial number
Formatting data	Formatting a document
Using formulas	Formula
Constant values	Constant value
Formatting numbers	Number

Functions and Macros

"Translating Data Types" in Chapter 1, "Introduction to Functions"

Wildcard

A **wildcard** is a character that stands for one or more characters. You can use wildcards to find data in your worksheet or as part of the criteria you use with a database. Microsoft Excel recognizes two wildcard characters: the question mark (?) and the asterisk (*).

The question mark (?) stands for any single character in the same position as the question mark. For example, if you want to search your database for a particular name, but aren't sure whether the name is Smith or Smyth, you could type *sm?th* as your criterion.

The asterisk (*) stands for any number of characters in that same position. For example, if you want to find all clients in a database whose companies are incorporated, and you have consistently typed *Inc.* at the end of their company names, you could type **inc.* as your criterion.

When you are searching a database, Microsoft Excel assumes there is an asterisk at the end of text you use as criteria. For example, if you type *smith* as your criterion, Microsoft Excel finds all clients whose names start with "Smith," such as Smith, Smithson, Smithsen, Smithers, and so on.

If you want Microsoft Excel to treat a question mark or asterisk as a regular character rather than as a wildcard character, precede the question mark or asterisk with a tilde (~). For example, to find FY87?, you type *FY87~?* as your criterion.

For more information on searching a worksheet or database, see **Finding cells and data quickly** and **Database.**

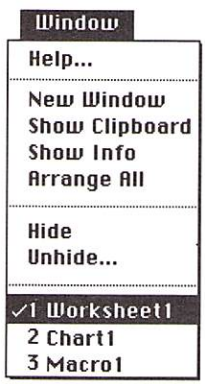
Window Activate Window command

Activates the window you choose.

This command is actually a group of commands at the bottom of the Window menu that change according to the windows you have open. Each command activates the window with the same name as the command you choose.

Use this command to quickly make a window active. The window names shown here are examples; your menu will show whatever windows you have open.

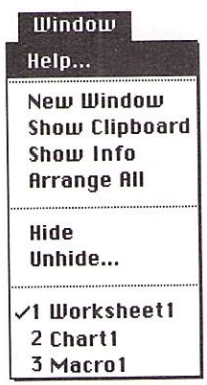
If you have more windows active at one time than will fit in the menu, the More Windows command appears on the Window menu below the active windows. For more information, see **Window More Windows command.**



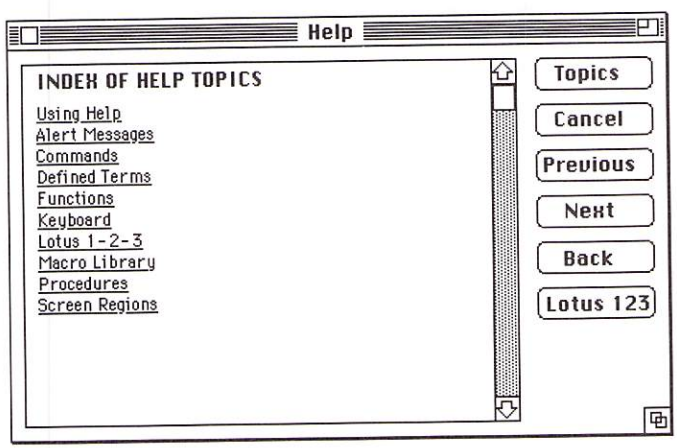
Window Arrange All command

Rearranges open windows in Microsoft Excel so that your windows use the available workspace most efficiently. You can also move and resize your document windows using standard mouse techniques. For more information on moving and sizing windows, see your Macintosh owner's manual.

Window Help command



Starts Help and displays the Help window. Help provides information on tasks, commands, and Microsoft Excel equivalents for Lotus 1-2-3 commands.



Topics Displays the list of topics covered in Help. The topic list is like an index; find the term you want in the topic list and click it to go to that topic.

Cancel Closes the Help window.

Previous Moves to the previous topic in Help.

Next Moves to the next topic in Help.

Back Moves to the last topic you were in.

Lotus 123 Displays a dialog box. Type the key sequence you would normally use to choose a command in Lotus 1-2-3, then click the OK button. Help tells you which Microsoft Excel command to use.

For more information on using Help, see the Using Help topic in Microsoft Excel Help.

Window Hide command

(Full Menus)

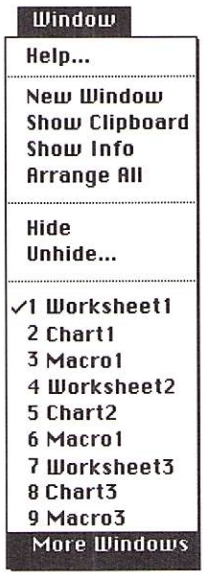
Hides the active window from view. Although hidden, the window remains open and data in it can be accessed by documents that have external references to it. You can also run macros from a hidden macro sheet.

Window Hide is especially useful when you want to have worksheets or macro sheets open so you can use their data or macros, but you don't need to see the data or macros and don't want them taking up room on your screen.

If the window is protected with the Options Protect Document command, Microsoft Excel asks you for the password before hiding the window, and again when you unhide the window with the Window Unhide command.

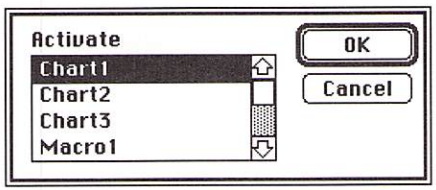
For more information on unhiding a window, see **Window Unhide command.**

Window More Windows command



Activates windows that are open but do not appear on the Window menu.

More Windows only appears on the Window menu when you have more windows open than can fit on the menu. The only limit to the number of windows you can have open at one time is the amount of memory in your computer.



Activate Lists all open windows. Select the window you want to activate, then click the OK button.

Window New Window command

Creates an additional window for the active document. A second window is especially useful for simultaneously viewing and working on two widely separated parts of your worksheet. Using this command, you can scroll the two windows independently. If you want synchronized scrolling in your worksheet, split the window with the split bars. For more information on splitting your worksheet, see **Windows.**

The new window has all the same properties as any other window. The title bar shows the name of the original document, followed by a colon and a number. The second window into a document has a 2 after the colon, the third has a 3, and so on. The number of additional windows you can have is limited only by the available memory.

Window Show Clipboard command

Opens the Clipboard window. If the Clipboard contains cells, the window shows the size of the Clipboard contents in rows and columns. If the Clipboard contains text cut from the formula bar, then the Clipboard window displays the text.

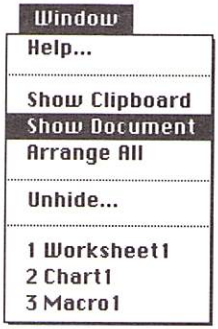
To close the Clipboard window, click its close box or choose the File Close command.

Window Show Document command

(Full Menus)

Activates the worksheet whose information is being displayed in the Info window.

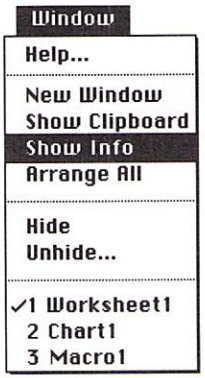
Window Show Document appears only when the Info window is the active window. Use the Window Show Info and Window Show Document commands to toggle between the Info window and the worksheet for which it shows information.

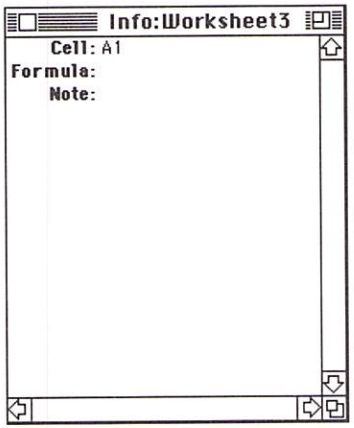


Window Show Info command

(Full Menus)

Shows the Info window, which displays information about the active worksheet or macro sheet.





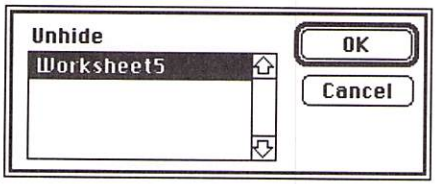
Window Show Info appears only when a worksheet or macro sheet is the active document. Use the Window Show Document and Window Show Info commands to toggle between the Info window and the worksheet for which it shows information.

You can control what is displayed in the Info window with the commands on the Info menu. The Info menu appears only when the Info window is active. For more information, see **Info window** and the individual Info commands.

Window Unhide command

(Full Menus)

Makes a hidden window visible.



Unhide Lists all hidden windows. Select the window you want to unhide and click the OK button. If the window is protected with the Options Protect Document command, Microsoft Excel asks for the password before unhiding the window.

For more information on hiding a window, see **Window Hide command.**

Windows

A **window** is a rectangular area on your screen in which you view or work on a document. In Microsoft Excel each worksheet, chart, or macro sheet you work on is displayed in a separate window. Using the mouse, you move, size, scroll through, switch between, or close windows as you would in any other Macintosh application.

This topic explains:

- An overview of working with windows

  Microsoft Excel windows

- Window basics

  The parts of a window

  Controlling windows

- Window techniques

  Selecting a window
  Scrolling a window
  Opening multiple windows into a worksheet
  Splitting a worksheet window into panes
  Freezing worksheet titles
  Displaying all open windows in the workspace
  Closing a window

This topic does not discuss the basic procedures for displaying menus, choosing commands, or working in dialog boxes. For information on those procedures, see **Command, menu, and dialog box.**

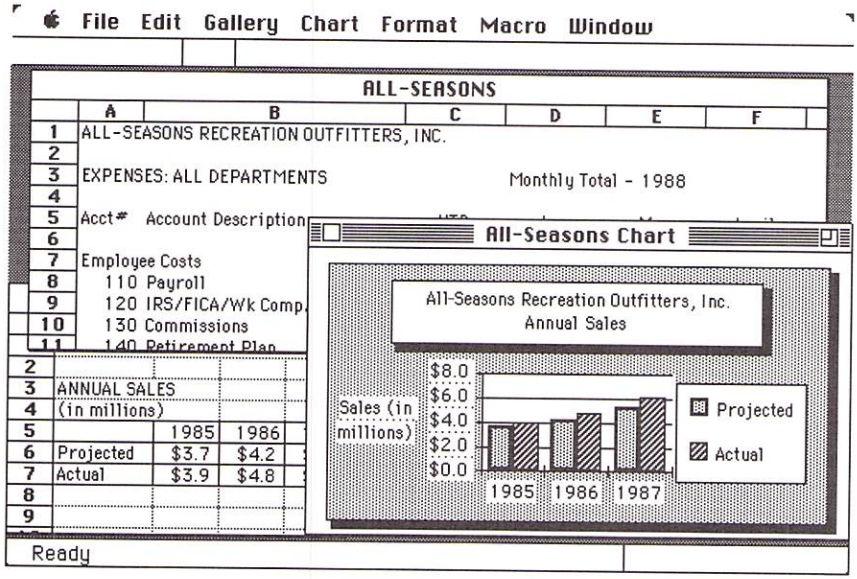
Note All worksheet window options also apply to macro sheets.

An Overview of Working with Windows

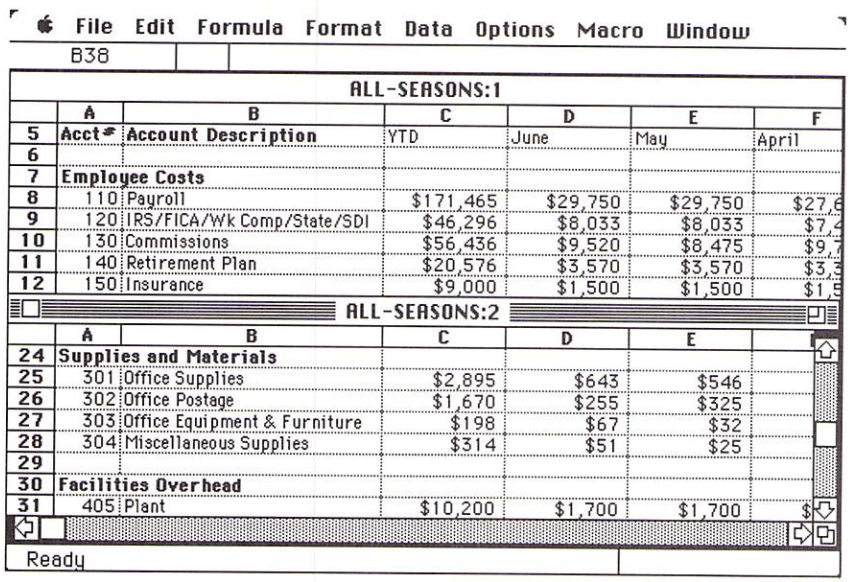
Working with windows lets you organize Microsoft Excel documents and tasks efficiently and provides powerful new ways to perform analysis.

Here are some effective ways to use windows with Microsoft Excel:

View and work on several documents, or different types of documents at the same time, easily switching between documents. Open worksheets and charts to simplify plotting worksheet data and easily analyze and compare data between documents.



View and work with many parts of a large document at the same time. By opening multiple windows into a large worksheet, you can easily work with widely scattered parts of the document. This simplifies data entry and lets you quickly compare several areas of data at once.


File Edit Formula Format Data Options Macro Window
B38
ALL-SEASONS:1
Acct# Account Description YTD June May April
Employee Costs
110 Payroll $171,465 $29,750 $29,750
120 IRS/FICA/Wk Comp/State/SDI $46,296 $8,033 $8,033
130 Commissions $56,436 $9,520 $8,475
140 Retirement Plan $20,576 $3,570 $3,570
150 Insurance $9,000 $1,500 $1,500
ALL-SEASONS:2
Supplies and Materials
301 Office Supplies $2,895 $643 $546
302 Office Postage $1,670 $255 $325
303 Office Equipment & Furniture $198 $67 $32
304 Miscellaneous Supplies $314 $51 $25
Facilities Overhead
405 Plant $10,200 $1,700 $1,700
Ready

Microsoft Excel Windows

You work with three types of windows in Microsoft Excel:

- **Document window** — displays the individual documents with which you work. A document window can display a chart, worksheet, or macro sheet.
- **Info window** — displays information on the active cell. This window updates as you select different cells on a worksheet.
- **Help window** — displays information and instructions for using Microsoft Excel.

The following sections provide you with an overview of Microsoft Excel windows.

Worksheet Window (Document)

A worksheet window shows part of a worksheet. You can open multiple windows into a worksheet to work on different areas of the worksheet at the same time, or display the worksheet in different formats, side by side. When a worksheet window is active, the Microsoft Excel menu bar displays worksheet menus. For information on worksheet basics, see **Worksheet.**

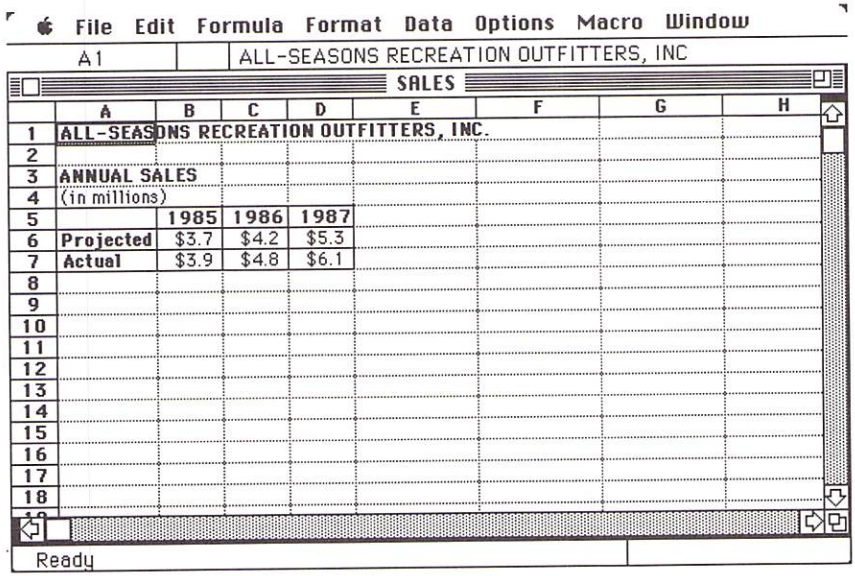
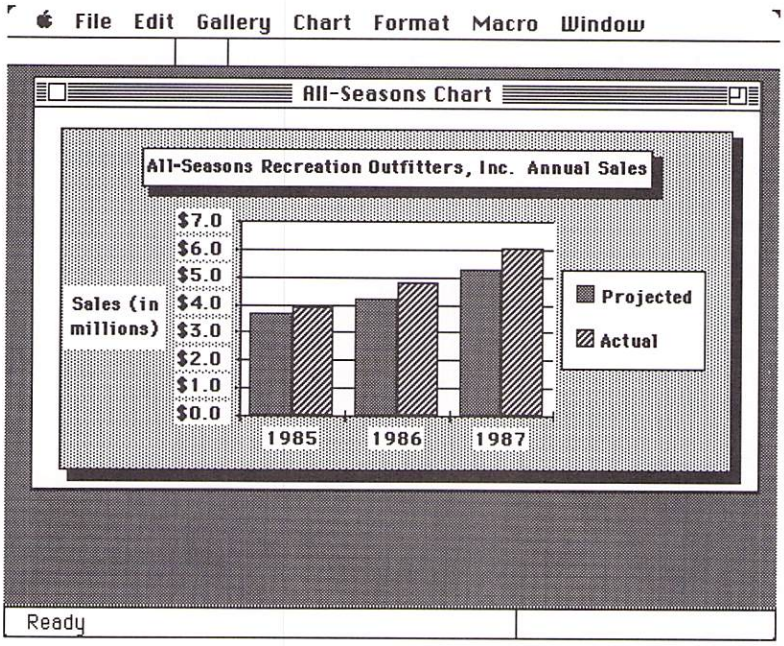


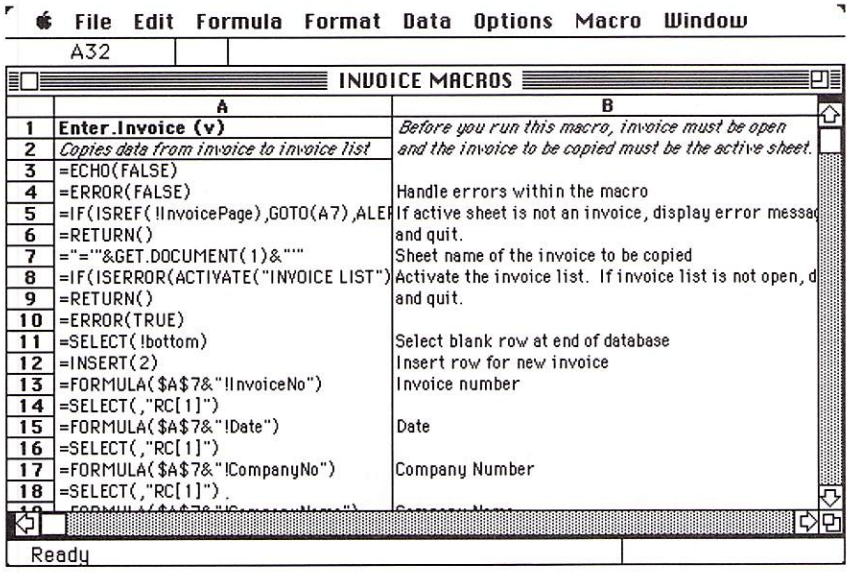
Chart Window (Document)

A chart window shows a chart. You can create 44 different types of built-in charts or a variety of customized charts in a chart window. When a chart window is active, the Microsoft Excel application window displays chart menus. For information on chart basics, see **Chart.**



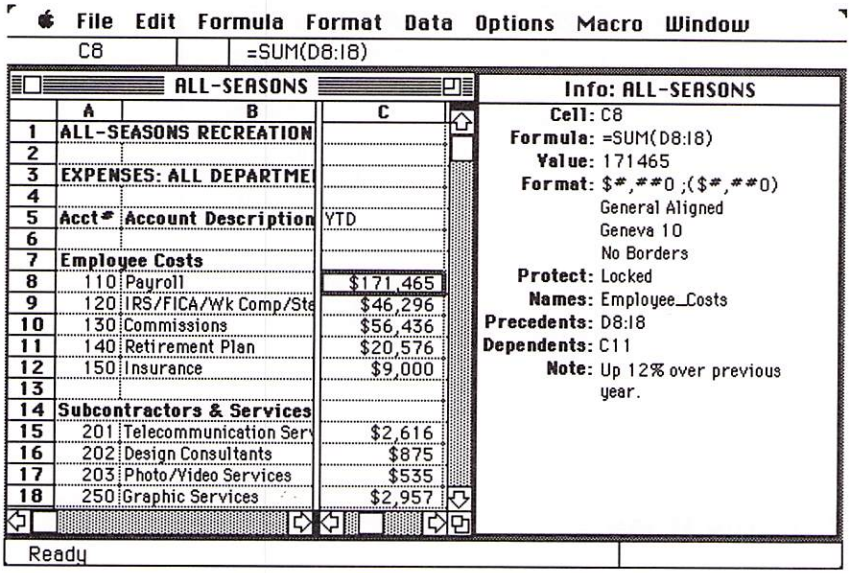
Macro Sheet Window (Document)

A macro sheet window is a view into a macro sheet, which you use to create and store macros. When a macro sheet is active, Microsoft Excel displays the same menus as for a worksheet. For information on macro sheet basics, see Chapter 3, "Introduction to Macros," in *Microsoft Excel Functions and Macros.*



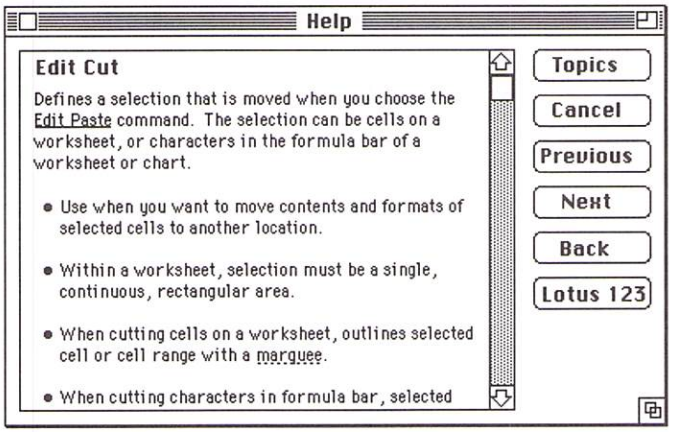
Info Window

The Info window is a view into a cell on a worksheet or macro sheet. You can use this window to examine information about the cell, such as its underlying formula, formats assigned to it, references and names associated with it, or cell notes attached to it. When the Info window is active, Microsoft Excel displays Info window menus. For more information, see **Info window.**



Help Window

The Help window is a view into the online Help information. The view can show either the index of topics covered in help or help text. Microsoft Excel Help provides quick information on commands, dialog boxes, messages, concepts, basic tasks, worksheet functions, and Microsoft Excel equivalents for Lotus 1-2-3. For information on using Microsoft Help, see **Help.**


Help
Edit Cut
Defines a selection that is moved when you choose the Edit Paste command. The selection can be cells on a worksheet, or characters in the formula bar of a worksheet or chart.
• Use when you want to move contents and formats of selected cells to another location.
• Within a worksheet, selection must be a single, continuous, rectangular area.
• When cutting cells on a worksheet, outlines selected cell or cell range with a marquee.
• When cutting characters in formula bar, selected
Topics
Cancel
Previous
Next
Back
Lotus 123

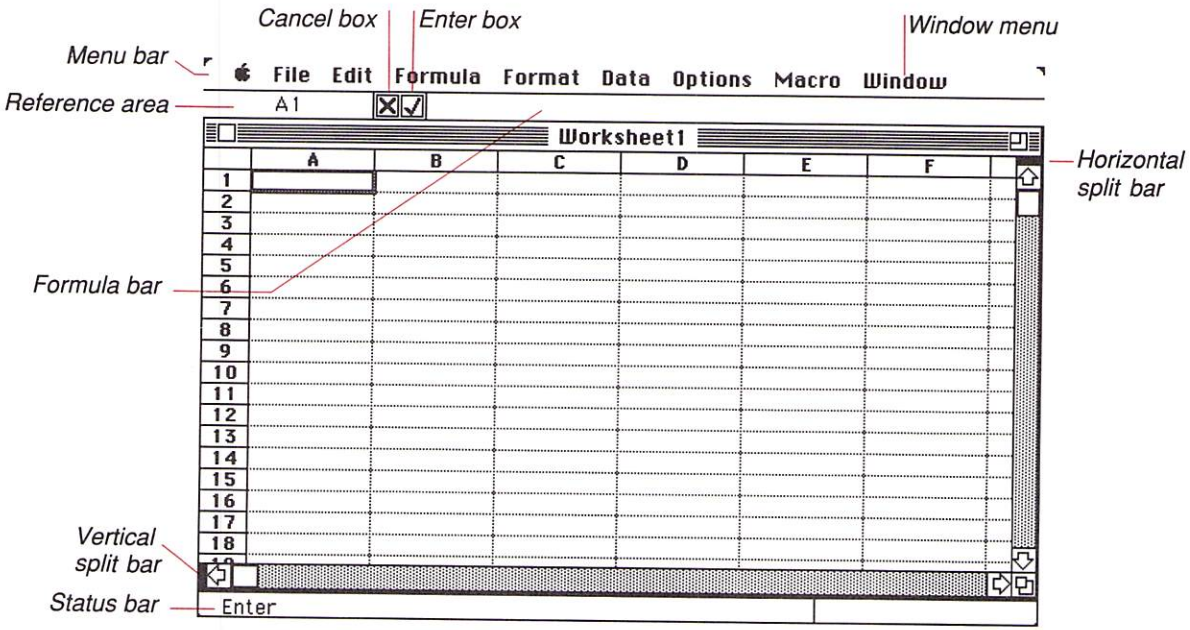
Window Basics

This section gives an overview of the parts of a window and the commands you use to control windows.

The Parts of a Window

Microsoft Excel offers a number of window features and includes standard Macintosh window features. For information on using standard Macintosh window features, consult your *Macintosh* manual. The following illustration shows a worksheet window.

This is how your screen looks when you start Microsoft Excel for the first time:



Microsoft Excel window features include:

Menu bar — displays the names of the menus for the application. The menu bar may also display a different set of menus, depending on the type of document window that is active.

Reference area — displays the row and column number of the active cell.

Formula bar — displays the contents of the active cell. You enter or change the contents of a cell in the formula bar.

Enter box — appears when the formula bar is active. Click the enter box to enter data in the formula bar into the active cell.

Cancel box — appears when the formula bar is active. Click the cancel box to cancel changes made in the formula bar.

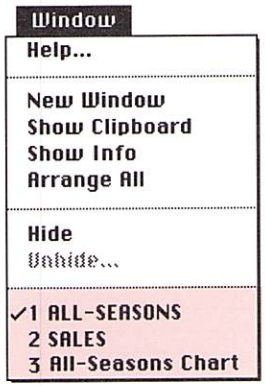
Split bar — used to divide a worksheet window into panes; the small black rectangle at the top of the vertical scroll bar splits a window horizontally; the one at the left of the horizontal scroll bar splits the window vertically.

Status bar — displays brief information about the currently selected command or the current state of Microsoft Excel.

Window menu — contains commands for controlling document windows (selecting, hiding, and arranging windows; opening multiple windows into a large document) and displaying the Info window.

Controlling Windows

You can use the standard mouse techniques for controlling windows as well as the commands on the Window menu:



- Use the Window activate window commands to quickly activate the document window you want. These commands change to reflect the names of the documents you have open.

For information on each Window menu command, see the command name topic. For information on keyboard shortcuts, see **Keyboard.**

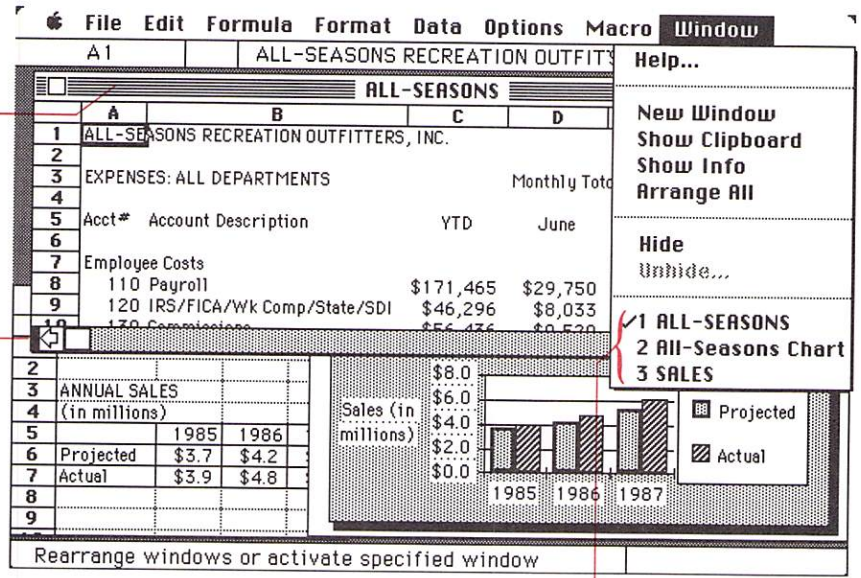
Window Techniques

Each of the following sections explains the basic mouse and keyboard procedures for an individual window technique. You may find mixing mouse and keyboard techniques to be the easiest way to perform certain tasks.

Note You should be familiar with how to choose commands using either mouse or keyboard techniques before you read these sections. For information on choosing a command, see **Command, menu, and dialog box.**

Selecting a Window

If you have opened several windows on the screen, you need to select the one you want to work in. Selecting a window makes it the active window. The title bar of the active window is striped.



Title bar of active window is striped.

If windows are overlapped, the active window is in front.

The Window menu lists document windows currently open. You can use this menu to select a window that is behind other windows.

To select a visible document window:

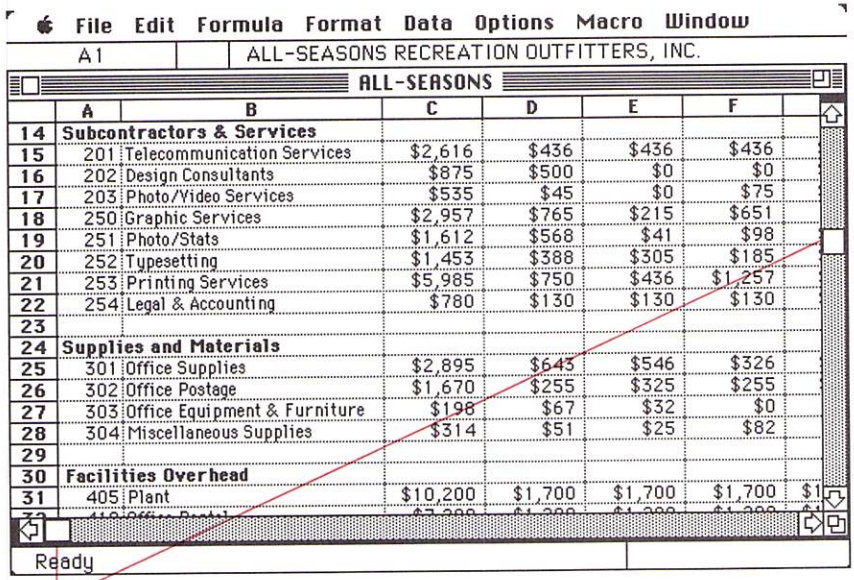
- Click anywhere in the window.

To select a document window hidden beneath other windows:

- Choose the document name from the Window menu.
  If more than one window for the same document is open, Microsoft Excel adds a number to the end of the document name for each window. Choose the name of the window you want to view.

Scrolling a Window

Worksheet and macro sheet windows have scroll bars that let you move through and view all parts of a document that is too long to display in a window at one time.



	A	B	C	D	E	F
14	**Subcontractors & Services**					
15	201	Telecommunication Services	$2,616	$436	$436	$436
16	202	Design Consultants	$875	$500	$0	$0
17	203	Photo/Video Services	$535	$45	$0	$75
18	250	Graphic Services	$2,957	$765	$215	$651
19	251	Photo/Stats	$1,612	$568	$41	$98
20	252	Typesetting	$1,453	$388	$305	$185
21	253	Printing Services	$5,985	$750	$436	$1,257
22	254	Legal & Accounting	$780	$130	$130	$130
23						
24	**Supplies and Materials**					
25	301	Office Supplies	$2,895	$643	$546	$326
26	302	Office Postage	$1,670	$255	$325	$255
27	303	Office Equipment & Furniture	$198	$67	$32	$0
28	304	Miscellaneous Supplies	$314	$51	$25	$82
29						
30	**Facilities Overhead**					
31	405	Plant	$10,200	$1,700	$1,700	$1,700

Scroll boxes indicate what portion of the data area (horizontal or vertical) is displayed.

To move or scroll a window with the mouse, use the scroll bars.

The following table tells you how to move or scroll a window using the keyboard:

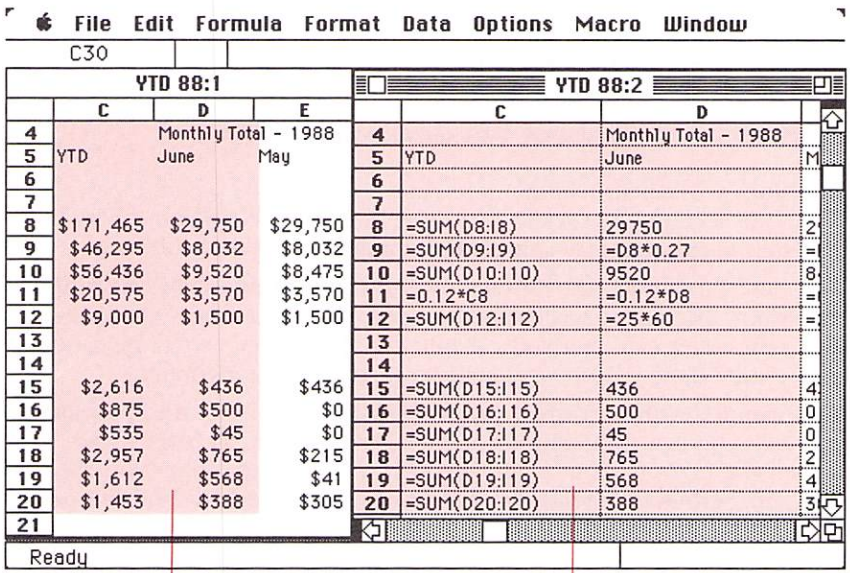
To scroll	Turn on Scroll Lock and press
One row up or down, or one column left or right	Direction keys
Up one window	Page Up
Down one window	Page Down
Left one window	Command + Page Up
Right one window	Command + Page Down
Upper-left corner of window	Home
End of window	End
Start of data	Command + Home
End of data	Command + End

Opening Multiple Windows into a Worksheet

It's often helpful to look at different parts of a large worksheet or macro sheet at the same time. For example, you may want to compare the effects of a "what-if" analysis on widely scattered data on a worksheet. Or, if your worksheet contains a database, you might find it convenient to view your criteria range in a separate window while finding records in the database range.

With the Window New Window command, you can open as many windows as you want into one worksheet. You can move and size multiple windows however you like. You can also set different display options for each window: for example, you can display values in one window and formulas in another.

The following illustration shows two windows for the same worksheet:



	C	D	E
4		Monthly Total - 1988	
5	YTD	June	May
6			
7			
8	$171,465	$29,750	$29,750
9	$46,295	$8,032	$8,032
10	$56,436	$9,520	$8,475
11	$20,575	$3,570	$3,570
12	$9,000	$1,500	$1,500
13			
14			
15	$2,616	$436	$436
16	$875	$500	$0
17	$535	$45	$0
18	$2,957	$765	$215
19	$1,612	$568	$41
20	$1,453	$388	$305
21			

	C	D
4		Monthly Total - 1988
5	YTD	June
6		
7		
8	=SUM(D8:I8)	29750
9	=SUM(D9:I9)	=D8*0.27
10	=SUM(D10:I10)	9520
11	=0.12*C8	=0.12*D8
12	=SUM(D12:I12)	=25*60
13		
14		
15	=SUM(D15:I15)	436
16	=SUM(D16:I16)	500
17	=SUM(D17:I17)	45
18	=SUM(D18:I18)	765
19	=SUM(D19:I19)	568
20	=SUM(D20:I20)	388

Formulas and Gridlines Display Options turned off in window 1.

Formulas and Gridlines Display Options turned on in window 2.

Any change you make in one window takes effect in all other windows for the document. You see your change in the other windows when you scroll each window to the area where the change occurred.

Note Opening multiple windows is different than opening a new worksheet with the File New command. The File New command creates a whole new worksheet. The Window New Window command creates another window into the same worksheet.

To open a new window for a worksheet:

1. Activate the window for the worksheet of which you want a second view.

   To move between windows, click the window you want or select the window name from the Window menu. If you are using the keyboard, press Command + M.
2. Choose Window New Window.

Tip If you want to see the formulas and values for a given worksheet area at the same time, open multiple windows for the worksheet. Display formulas in one window and values in the other.

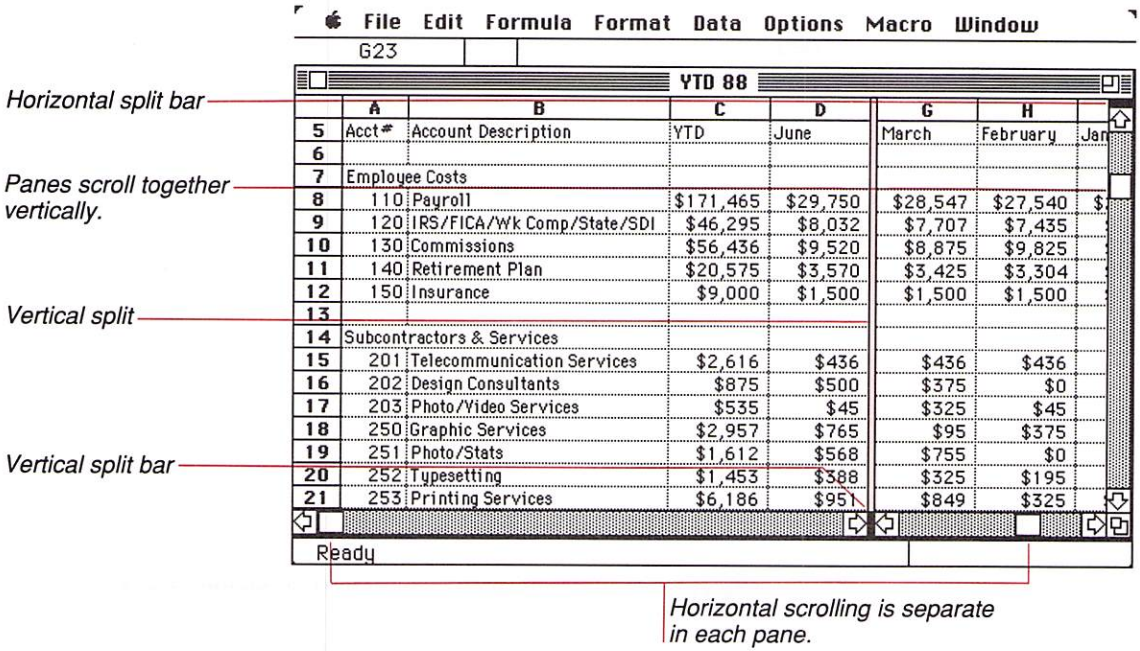
Splitting a Worksheet Window into Panes

Splitting a worksheet window into panes lets you see separate parts of the worksheet and still scroll them together. This technique is also the first step in freezing row and column titles.

You can split any worksheet window vertically, horizontally, or in both directions. The panes scroll together along the direction of the split: panes on either side of a vertical split scroll together vertically; panes above and below a horizontal split scroll together horizontally.

For example, with horizontal panes across the middle of the worksheet window, you can view a block of eight rows in the top half of your screen and eight rows in a different section of the worksheet on the bottom half. Scrolling horizontally displays the same columns in both panes.

The following illustration shows a worksheet window split into vertical panes:



	A	B	C	D	G	H	
5	Acct #	Account Description	YTD	June	March	February	Jan
6							
7	Employee Costs						
8	110	Payroll	$171,465	$29,750	$28,547	$27,540	$
9	120	IRS/FICA/Wk Comp/State/SDI	$46,295	$8,032	$7,707	$7,435	
10	130	Commissions	$56,436	$9,520	$8,875	$9,825	
11	140	Retirement Plan	$20,575	$3,570	$3,425	$3,304	
12	150	Insurance	$9,000	$1,500	$1,500	$1,500	
13							
14	Subcontractors & Services						
15	201	Telecommunication Services	$2,616	$436	$436	$436	
16	202	Design Consultants	$875	$500	$375	$0	
17	203	Photo/Video Services	$535	$45	$325	$45	
18	250	Graphic Services	$2,957	$765	$95	$375	
19	251	Photo/Stats	$1,612	$568	$755	$0	
20	252	Typesetting	$1,453	$388	$325	$195	
21	253	Printing Services	$6,186	$951	$849	$325	

Note If you have opened multiple windows for one worksheet (see the preceding section in this topic), you can also specify different splits in each of those windows.

To split a window into panes:

1. For a vertical split, point to the vertical split bar. For a horizontal split, point to the horizontal split bar.

   The mouse pointer turns into a two-way arrow indicating vertical or horizontal direction.
2. Drag the split bar until it lines up with the right edge of the column or the bottom edge of the row where you want to divide the window. The split bar extends as a gray bar across the worksheet while you drag it.
3. Release the mouse button.

To move among panes, click the pane you want.

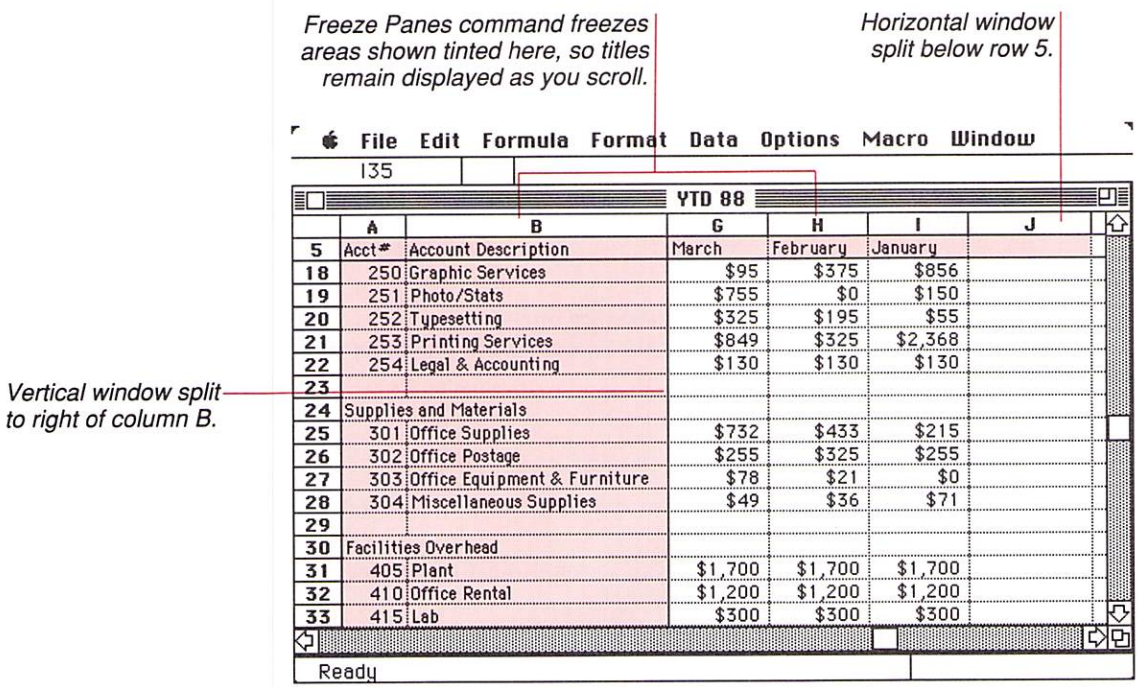
To remove splits from a window:

- Drag the split bars back to the window border.

Freezing Worksheet Titles
(Full Menus)

Freezing worksheet titles lets you display designated rows and/or columns on the screen at all times. This is useful for scrolling through a long worksheet and keeping track of titles that pertain to a given section of the worksheet but are out of the display boundary of the worksheet window. To freeze titles, you use the technique for splitting a window into panes (see the preceding section in this topic) in combination with the Freeze Panes command.

The following illustration shows how this technique works:


Freeze Panes command freezes areas shown tinted here, so titles remain displayed as you scroll.
Horizontal window split below row 5.
Vertical window split to right of column B.
File Edit Formula Format Data Options Macro Window
135
YTD 88
Ready

	A	B	G	H	I	J
5	Acct#	Account Description	March	February	January	
18	250	Graphic Services	$95	$375	$856	
19	251	Photo/Stats	$755	$0	$150	
20	252	Typesetting	$325	$195	$55	
21	253	Printing Services	$849	$325	$2,368	
22	254	Legal & Accounting	$130	$130	$130	
23						
24	Supplies and Materials					
25	301	Office Supplies	$732	$433	$215	
26	302	Office Postage	$255	$325	$255	
27	303	Office Equipment & Furniture	$78	$21	$0	
28	304	Miscellaneous Supplies	$49	$36	$71	
29						
30	Facilities Overhead					
31	405	Plant	$1,700	$1,700	$1,700	
32	410	Office Rental	$1,200	$1,200	$1,200	
33	415	Lab	$300	$300	$300	

To freeze titles in a column	To freeze titles in a row	To freeze both column and row titles
1 Create vertical panes. The split should be at the right edge of the cells with titles you want to freeze.	1 Create horizontal panes. The split should be at the bottom edge of the cells with titles you want to freeze.	1 Create vertical and horizontal panes. The splits should be to the right and just below the cells with the titles you want to freeze.
2 Choose Options Freeze Panes.	2 Choose Options Freeze Panes.	2 Choose Options Freeze Panes.

When a worksheet window with frozen titles is active, the Options Freeze Panes command changes to Options Unfreeze Panes.

To unfreeze titles:

1 Activate the window.

2 Choose Options Unfreeze Panes.

Note If you have opened multiple windows for one worksheet, you can freeze different titles in each window.

Displaying All Open Windows in the Workspace

To display all open windows in the workspace, you can use the standard techniques for moving and sizing windows, or you can use a technique called **automatic tiling** to display all open windows. With automatic tiling, Microsoft Excel arranges all open windows so that the window borders interlock in the workspace with no overlap or blank space between them.

To tile all open windows in the workspace:

■ Choose Window Arrange All.

Tip You can prevent some of the open windows from being tiled by hiding them before choosing Window Arrange All. For more information on hiding windows, see **Window Hide command.**

Closing a Window

You can close a document window at any time to clear your workspace. If you have made changes to a document that you have not yet saved and you close the last open window for that document, Microsoft Excel displays a message asking if you want to save changes. Click the Yes button to save changes, the No button to cancel changes to the document, or the Cancel button to cancel the command.

To close a document window:

1. Select the document window you want to close.
2. Choose File Close or click the close box.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart
Setting display options for a window or the workspace	Display options

You can find more information about Microsoft Excel basics in the other core topics: **Chart; Command, menu, and dialog box; Database; Help;** and **Worksheet.**

Sampler

Calculating a Sales Commission

Worksheet

A **worksheet** (also called a spreadsheet) is the primary document you use in Microsoft Excel to store and manipulate data. Each Microsoft Excel worksheet is a rectangular grid of 256 columns and 16,384 rows. The intersection of each column and row is a **cell**, the basic unit of a worksheet.

This topic explains:

- Worksheet basics
  - Creating a new worksheet
  - Worksheet window
  - Entering data in a cell
  - Entering data in a range
  - Types of data
  - Guidelines for entering data
  - Modes in Microsoft Excel
  - Moving and selecting with the mouse
  - Moving and selecting with the keyboard
  - Getting help
- Putting the worksheet to work
- Editing a worksheet
  - Guide to worksheet editing topics
- Formatting a worksheet
  - Guide to worksheet formatting topics
- Saving and printing a worksheet
  - Saving a new worksheet
  - Printing a worksheet

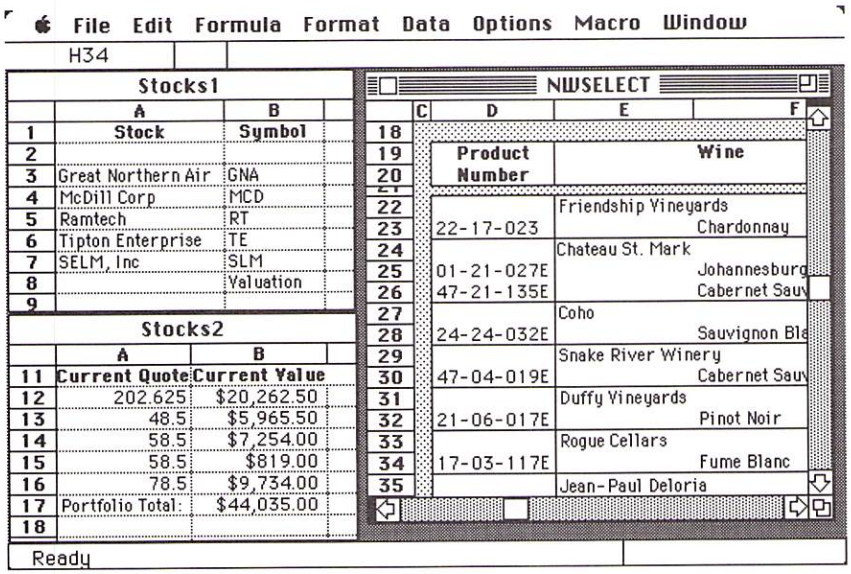
This topic does not discuss basic procedures for displaying menus, choosing commands, or working in dialog boxes. For information on those procedures, see **Command, menu, and dialog box.**

Note Most worksheet procedures and options also apply to macro sheets. A macro sheet is a special kind of worksheet that you use to create and store macros. For more information on macro sheets, see **Macro** and **Macro sheet** in this manual, and *Microsoft Excel Functions and Macros.*

Worksheet Basics

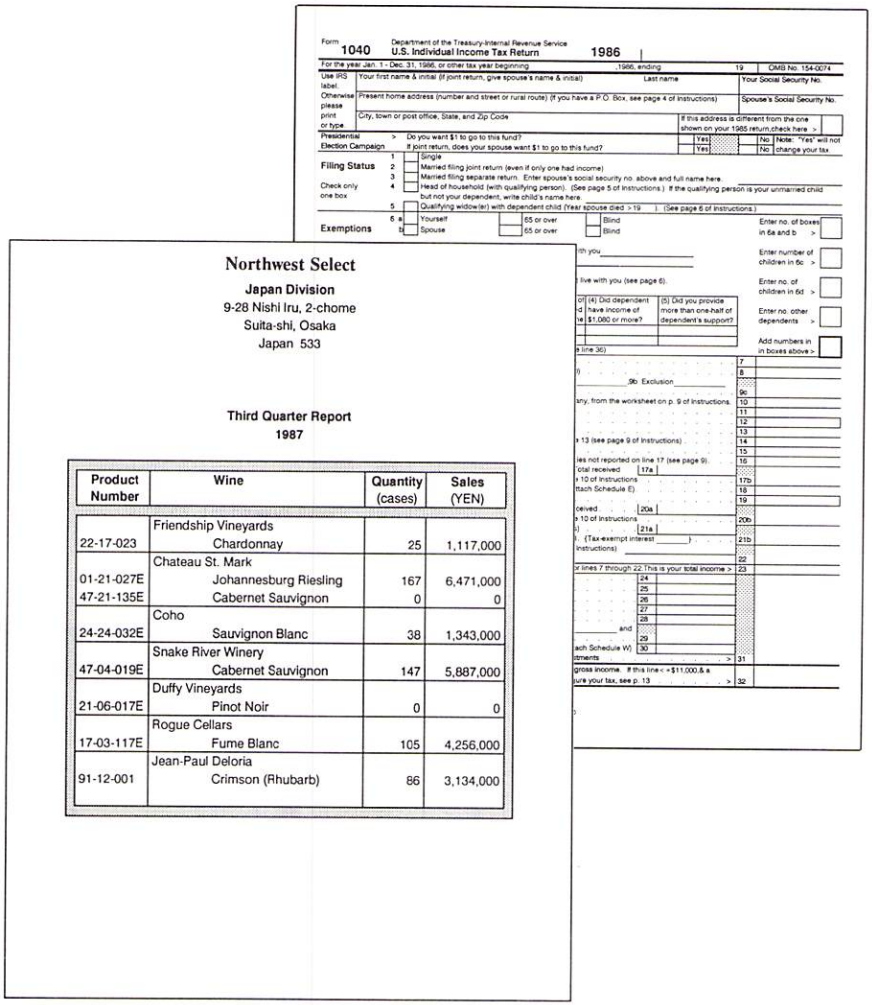
A Microsoft Excel worksheet provides the automated spreadsheet tools you need for projections, calculations, data analysis, decision-making, and reporting.

In Microsoft Excel, you can work efficiently with several worksheets, charts, and macro sheets on your screen at one time, or create multiple views of a large worksheet. As shown here, you can open more than one worksheet.



You can use Microsoft Excel worksheets to produce high-quality printouts for a variety of purposes. For example, you can use worksheets for reports or for data entry forms.

The following printouts were created with Microsoft Excel and a laser printer:



Form 1040 — Department of the Treasury-Internal Revenue Service
U.S. Individual Income Tax Return 1986

For the year Jan. 1-Dec. 31, 1986, or other tax year beginning ,1986, ending 19 — OMB No. 154-0074

Use IRS label. Your first name & initial (if joint return, give spouse's name & initial) Last name — Your Social Security No.

Otherwise please print or type. Present home address (number and street or rural route) (If you have a P.O. Box, see page 4 of instructions) — Spouse's Social Security No.

City, town or post office, State, and Zip Code — If this address is different from the one shown on your 1985 return, check here >

Presidential Election Campaign > Do you want $1 to go to this fund? Yes No Note: "Yes" will not change your tax
If joint return, does your spouse want $1 to go to this fund? Yes No

Filing Status — Check only one box
1 Single
2 Married filing joint return (even if only one had income)
3 Married filing separate return. Enter spouse's social security no. above and full name here.
4 Head of household (with qualifying person). (See page 5 of instructions.) If the qualifying person is your unmarried child but not your dependent, write child's name here.
5 Qualifying widow(er) with dependent child (Year spouse died > 19) (See page 6 of instructions.)

Exemptions
6a Yourself — 65 or over — Blind
b Spouse — 65 or over — Blind
Enter no. of boxes in 6a and b >
Enter number of children in 6c >
Enter no. of children in 6d >
Enter no. other dependents >
Add numbers in boxes above >

(4) Did dependent have income of $1,080 or more? | (5) Did you provide more than one-half of dependent's support?

Income
7 Wages, salaries, tips, etc. (attach Form(s) W-2)
8 Interest income (see page 8 of instructions). If over $400, you cannot use Form 1040A or 1040EZ.
9a Dividends
9b Exclusion
9c Subtract line 9b from line 9a
10 Total dividends, from the worksheet on p. 9 of instructions.
11 State and local income tax refunds (see page 9 of instructions)
12 Alimony received
13 Business income or (loss) (attach Schedule C) (see page 9 of instructions)
14 Capital gain or (loss) (attach Schedule D)
15 Other gains or (losses) (attach Form 4797)
16 Total pensions and annuities not reported on line 17 (see page 9).
17a Total IRA distributions received
17b Taxable amount (see page 10 of instructions)
18 Rents, royalties, partnerships, estates, trusts, etc. (attach Schedule E)
19 Farm income or (loss) (attach Schedule F)
20a Total social security benefits received
20b Taxable amount (see page 10 of instructions)
21a Other income (list type and amount)
21b Total income (Tax-exempt interest $) (see page 10 of instructions)
22 Add lines 7 through 22. This is your total income >

Adjustments to Income
24
25
26
27
28
29 Moving expense (attach Form 3903 or 3903F)
30 One-half of self-employment tax (attach Schedule SE)
31 Total adjustments >

32 Subtract line 31 from line 23. This is your adjusted gross income. If this line < +$11,000 & a ... see p. 13 to find your tax. >

Northwest Select

Japan Division
9-28 Nishi Iru, 2-chome
Suita-shi, Osaka
Japan 533

Third Quarter Report
1987

Product Number	Wine	Quantity (cases)	Sales (YEN)
22-17-023	Friendship Vineyards Chardonnay	25	1,117,000
01-21-027E	Chateau St. Mark Johannesburg Riesling	167	6,471,000
47-21-135E	Cabernet Sauvignon	0	0
24-24-032E	Coho Sauvignon Blanc	38	1,343,000
47-04-019E	Snake River Winery Cabernet Sauvignon	147	5,887,000
21-06-017E	Duffy Vineyards Pinot Noir	0	0
17-03-117E	Rogue Cellars Fume Blanc	105	4,256,000
91-12-001	Jean-Paul Deloria Crimson (Rhubarb)	86	3,134,000

Creating a New Worksheet

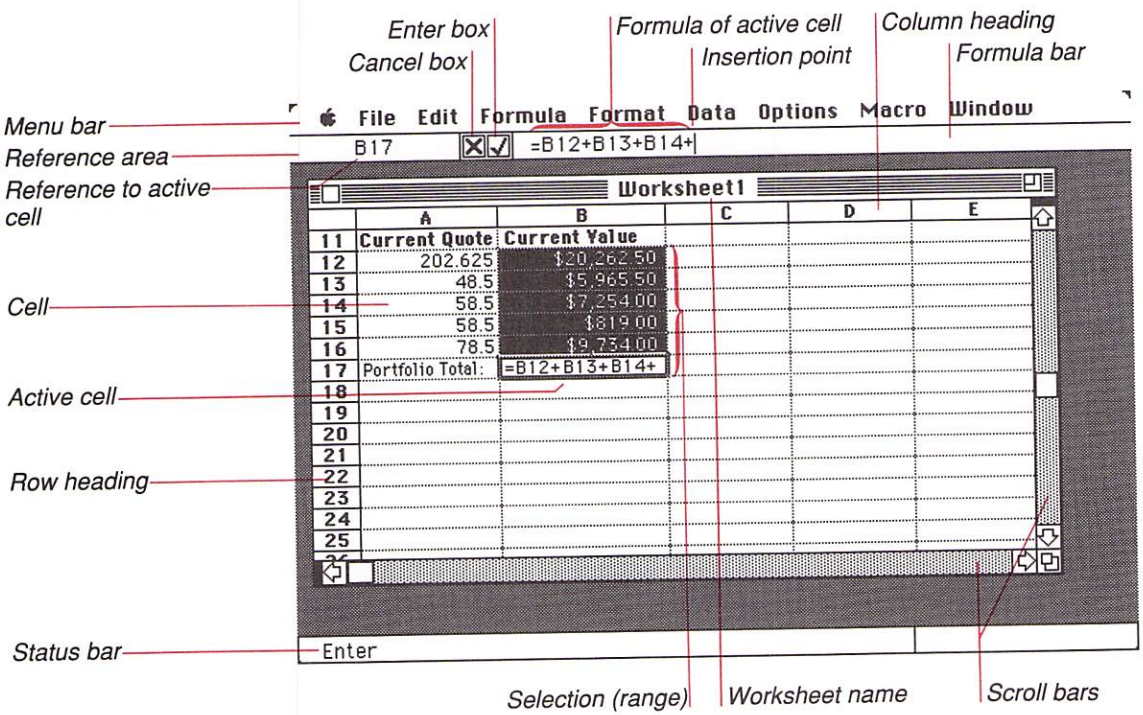
Microsoft Excel automatically creates a new worksheet whenever you start the application without specifying a document. During a work session, you can create additional new worksheets.

1. Choose File New.
2. Click Worksheet.
3. Click the OK button.

Worksheet Window

Worksheets are displayed in a worksheet window. You can move and size a worksheet window as you would any other window. This enables you to view one or more worksheet windows in the workspace at the same time. You can also open chart and macro sheet windows.

The following illustration shows the main parts of a worksheet window and highlights essential terms used throughout this manual:



Menu bar — the bar at the top of the Microsoft Excel window that displays the names of the menus for worksheets when a worksheet window is active.

Column heading — a heading that identifies a column on a worksheet. Column headings are at the top of each column. In A1 reference style (the default), column headings are labeled A through IV (A, B, . . .Z; AA, AB, . . .AZ; . . .IV). In R1C1 reference style, column headings are labeled 1 through 256.

Row heading — a heading that identifies a row on a worksheet. Row headings are at the left of each row and are labeled 1 through 16384 (both A1 and R1C1 reference style).

Cell — the basic unit of a worksheet, in which you can enter and store data. The intersection of every row and every column on a worksheet forms one cell. You can enter a **constant value** or a **formula** in a cell. A constant value can be a number (including a date or time), text, a logical value, or an error value. A formula calculates a new value from existing values.

Active cell — the cell displayed with a highlighted border, which indicates that the cell is **selected** and that the next data you type will be entered into this cell. If you select more than one cell, the first cell selected is displayed as the active cell; the other cells are displayed in reverse-video (as in the preceding illustration).

Reference — the row/column location of a cell in a worksheet. For example, in A1 reference style, the reference D17 designates the cell in column D, row 17. In R1C1 reference style, the same cell would be designated R17C4, the cell in row 17, column 4.

Formula bar — the part of the Microsoft Excel window that you use to enter or edit data in a worksheet cell. The formula bar displays the constant value or formula contained in the active cell. The **reference area** displays a reference to the active cell. The **insertion point**, the blinking vertical line in the formula bar, indicates where text will be inserted when you begin typing. You complete a cell entry or an edit you've made to an entry by pressing Enter or clicking the **enter box** with the mouse. You cancel an entry or edit by pressing Command+. (period) or clicking the **cancel box** with the mouse.

Selection — the highlighted cell, range, or characters (in the formula bar) that will be affected by the next command or action. Before entering data and for most commands and operations, you first select (designate by highlighting) the cells you want to work with. A selection can be a single cell, a **range** (rectangular section of a worksheet containing two or more cells, as in the preceding illustration), or a **multiple selection** (any combination of single cells or ranges of cells). A worksheet selection is usually highlighted — the active cell with a heavy dotted border, any other selected cells with reverse-video; characters selected in the formula bar also appear in reverse-video.

Scroll bar — a bar used to move through and view a worksheet too large to be displayed entirely in one worksheet window.

Split bar — a bar used to divide a worksheet window into panes. The small black rectangle at the top of the vertical scroll bar splits a window horizontally; the one at the left of the horizontal scroll bar splits the window vertically.

Status bar — a bar across the bottom of the worksheet window that displays information about the currently selected command and the status of the Microsoft Excel workspace.

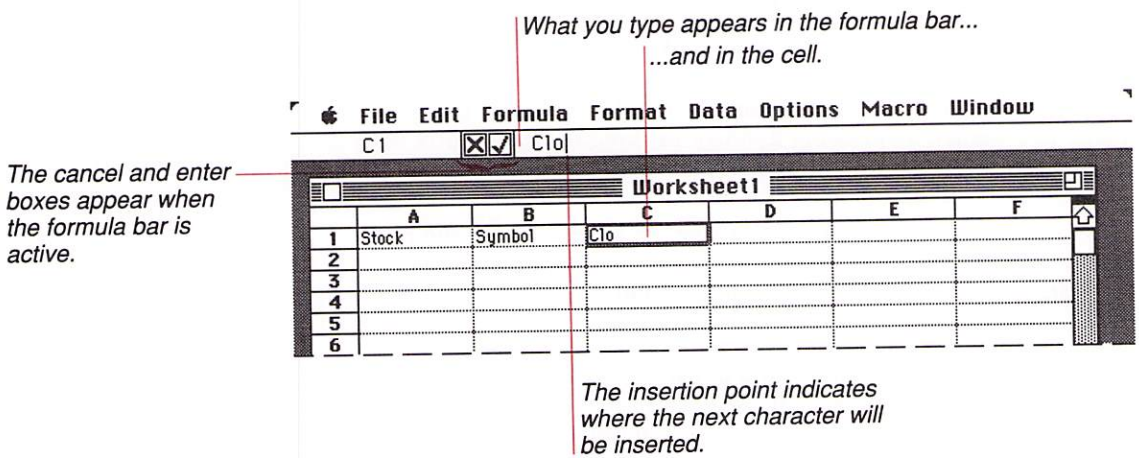
Worksheet name — the name of the document that appears in the title bar of the window. Microsoft Excel automatically names each sheet you open Worksheet1, Worksheet2, and so on. You rename each sheet with a document name of your choice when you save it.

A worksheet window also contains other standard Macintosh features, such as a close and zoom box. For more information on the parts of a window and basic window techniques, see **Windows.**

Note In Microsoft Excel, the mouse pointer takes on a different shape depending on its position on the screen.

Entering Data in a Cell

In Microsoft Excel you use the formula bar for all data entry and editing. To enter data in a worksheet, you first select a cell to make it the active cell. Then you type the data for the active cell in the formula bar, as shown here:


What you type appears in the formula bar...
...and in the cell.
File Edit Formula Format Data Options Macro Window
C1
Clo
Worksheet1
A B C D E F
1 Stock Symbol Clo
2
3
4
5
6
The cancel and enter boxes appear when the formula bar is active.
The insertion point indicates where the next character will be inserted.

If you press Enter or click the enter box with the mouse, Microsoft Excel enters the data in the cell. If you press Command+. (period) or click the cancel box, the data is cleared from the formula bar and the cell.

The formula bar is inactive whenever the enter and cancel boxes are not displayed—for example, when you first open a new worksheet or select cells before choosing a command. If you start typing or editing cell data, the formula bar becomes active.

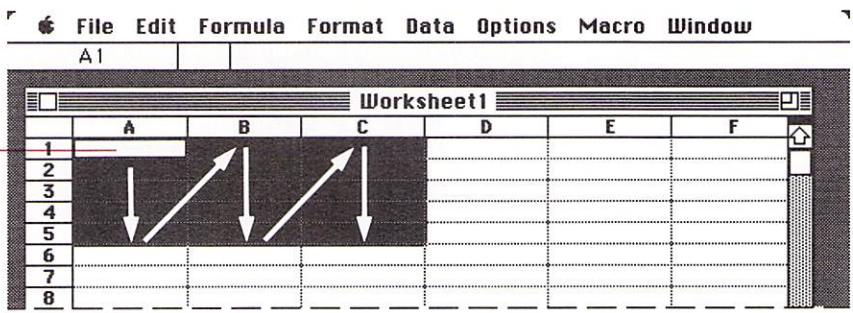
To enter data in a cell:

1. Click the cell you want for the active cell.
   You can also press the Up, Down, Left, or Right Arrow keys to move to and select the cell you want.
2. Type the data in the formula bar.
   Press Backspace to erase characters if you need to make corrections.
3. Press Enter or click the enter box.

Note All but a few commands on menus are grayed when the formula bar is active. Grayed commands are not available until you complete the entry in the formula bar. If you want to work in the worksheet rather than the formula bar and notice that most commands are grayed, make sure the formula bar is not active.

Entering Data in a Range

When entering data into several adjacent cells, you can speed up data entry by first selecting those cells as a range. You can then make several entries, one after the other, in successive cells in the range.



Type the data for each cell and press Return or click the enter box to continue moving through the selection, as shown here.

Once you have selected a range, you can use the keys in the following table to move within the selection and still keep the cells selected (using Direction keys, however, will undo the selection).

To	Press
Move down one cell in the selection	Return
Move up one cell in the selection	Shift + Return
Move right one cell	Tab
Move left one cell in the selection	Shift + Tab

These procedures and techniques also apply to multiple selections. In addition, you can use Command + Tab to move to the next area in a multiple selection and Command + Shift + Tab to move to the previous area. For more information on multiple selections, see **Selection.**

To select a range of cells and enter data using the mouse:

1. Point to the first cell in the range.
2. Drag through the cells you want.
3. In the formula bar, type the data for the first cell.
   Press Backspace to erase characters if you need to make corrections.
4. Click the enter box.

To select a range of cells and enter data using the keyboard:

1. Press the Up, Down, Left, or Right Arrow keys to move to the first cell you want to select.
2. Hold down Shift and press individual Direction keys, extending the selection to include the cells you want.
3. In the formula bar, type the data for the first cell.
   Press Backspace to erase characters if you need to make corrections.
4. Press Enter.

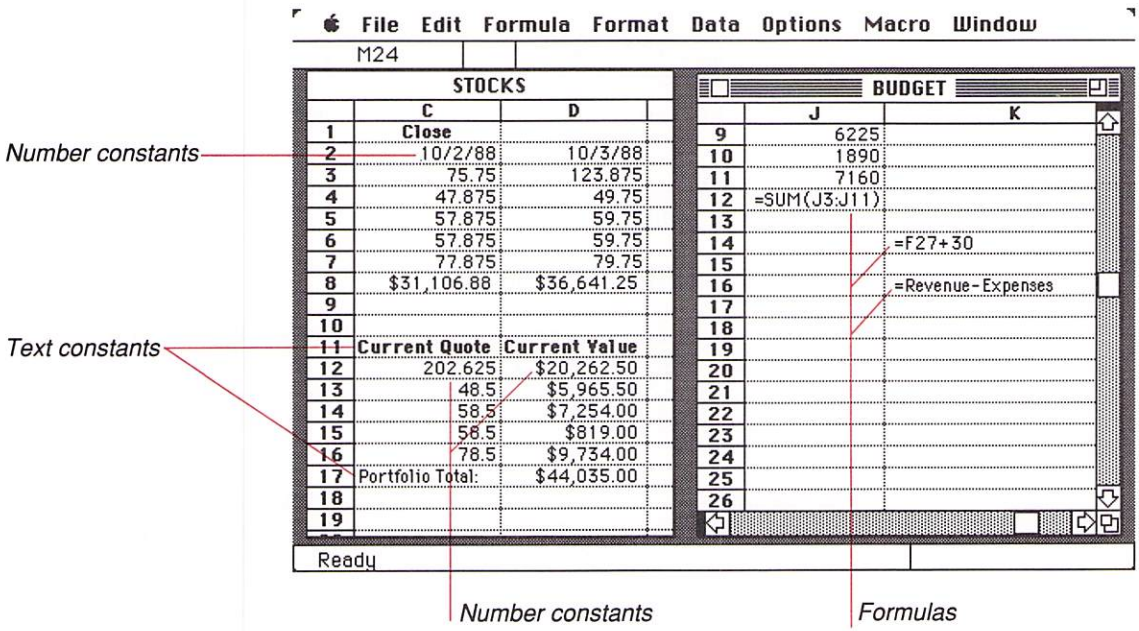
For information on additional data entry and editing techniques, see "Modes in Microsoft Excel," later in this topic.

Types of Data

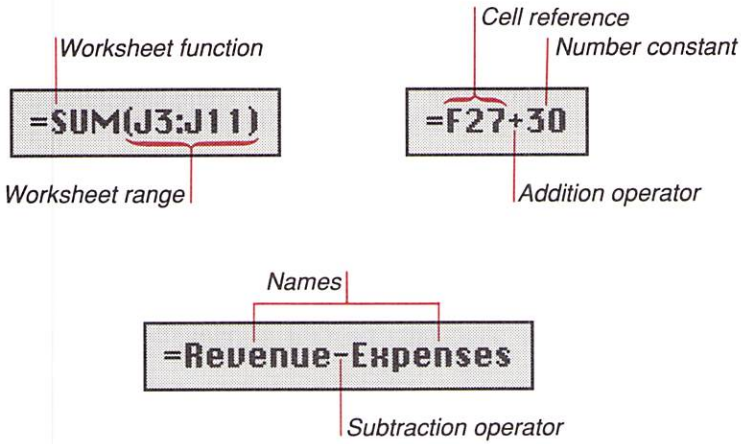
You can enter two basic types of data in a worksheet:

- **Constant value** — text, a number (including a date or time), a logical value, or an error value
- **Formula** — a sequence of values, cell references, names, functions, or operators that produces a new value from existing values

The following illustration shows examples of these types of data in two different worksheets. The worksheet on the right is set up to display formulas in the cells:



Here's a close-up of the formulas in the preceding illustration to show the types of data you can include in a formula:



For more information on displaying formulas or values in a worksheet, see **Display options.**

Guidelines for Entering Data

This section summarizes procedures and guidelines for entering constants (numbers, text, logical values, and error values) and formulas in a worksheet. For detailed information on procedures related to the types of data discussed here, refer to the topics listed at the end of this section.

- **Numbers** — To enter a number as a constant, just type the number. You can enter a number in three basic formats: integer, decimal, and scientific. Microsoft Excel also accepts several other formats for constants. For example, to indicate a negative number, enter a minus sign before the number or enclose it in parentheses. You can enter a comma in a number constant, a dollar sign ($) before it, or a percent sign (%) after it. You can also enter a number in a built-in date or time format.

To enter a number in a formula, just type the number (the formula should begin with an equal sign — see "Formulas," below). In a formula, you cannot use parentheses to indicate a negative number, a comma to separate thousands, or a dollar sign preceding the number. If you type a percent sign after a number, Microsoft Excel interprets it as the percentage operator and stores it as part of the formula. In a formula, you cannot enter numbers in date or time formats directly. However, in most formulas you can enter a date or time as text enclosed in double quotation marks, and Microsoft Excel will convert it to the corresponding number when calculating the formula. For example, the result of the formula ="12/31/88"-"11/30/88" is 31, the number of days between the two dates.

- **Text** — To enter text as a constant, just type the text. To enter text as part of a formula, enclose the text in double quotation marks. Text constants and text included in formulas cannot exceed 255 characters. Microsoft Excel interprets as a text constant anything it doesn't recognize as a number, logical value, error value, or formula. If you need to enter a text constant that Microsoft Excel interprets as a number, logical value, or error value, enter the text as a formula instead. For example, you cannot enter the number *205* as a text constant, but you can achieve the same effect by entering the formula *="205"*
- **Logical values and error values** — To enter a logical value or an error value as a constant or as part of a formula, just type the value. The valid logical values are TRUE and FALSE. The valid error values are #N/A, #VALUE!, #REF!, #NULL!, #DIV/0!, #NUM!, and #NAME?. You can type logical and error values in either uppercase or lowercase.
- **Formulas** — To enter a formula, type an equal sign (=) and then the sequence of values, cell references, operators, functions, or names. After typing an equal sign, operator, comma, or left parenthesis, you can insert a cell or range reference by using the Direction keys or the mouse to point to a cell or range (see "Modes in Microsoft Excel," later in this topic). You can also include names and functions in the formula bar with the Formula Paste Name and the Formula Paste Function commands.
- **Undoing mistakes in the formula bar** — If you make a mistake while typing in the formula bar, you can erase the incorrect characters using the Backspace key. You can also click the formula bar to enter Edit mode and perform more extensive editing (see "Modes in Microsoft Excel," later in this topic).

- **Commands you can use in the formula bar** — Only the following commands are available when the formula bar is active: the Edit Cut, Edit Copy, Edit Paste, and Edit Clear commands; the Formula Paste Function, Formula Reference, Formula Goto, and Formula Paste Name (if you have defined names) commands; the Options Calculate Now, Options Short Menus, and Options Full Menus commands; and the Window Arrange All, Window Help, Window Show Clipboard, and Window Activate Window commands.
- **Formatting cells as you type** — If you enter a number using a built-in format into a cell that has the General format (the default format), Microsoft Excel assigns the format you type to that cell. For example, if you type a date using a built-in date format, Microsoft Excel automatically assigns that date format to the cell.
- **Numeric entries that exceed column width** — If a number value is too long to display in a cell that has the General format (the default), Microsoft Excel stores the value as you enter it, but displays the number in scientific notation. For example, 25,000,000,000 would be displayed as 2.5E+10. If the number in exponential notation is still too long, or if the cell has any format other than General, Microsoft Excel displays a series of number signs (####). You can increase the column width to fully display the number.
- **Text, logical value, and error value entries that exceed column width** — If a text value exceeds the column width of a cell, Microsoft Excel stores the text as you enter it and overlaps the display of the text into the cells to the right until it encounters a cell that is not empty. For a logical or error value that exceeds the column width of the cell, Microsoft Excel stores the value, but displays a series of number signs (####). You can increase column widths to fully display long entries.
- **Calculation and values stored versus display formats** — Microsoft Excel calculates on the basis of the underlying stored values in cells, not their display formats. The built-in or custom number formats you apply with the Format Number command change the appearance of the displayed value of a cell but don't affect its formula or stored value. Microsoft Excel calculates on the basis of displayed values only when you specify Precision As Displayed through the Options Calculation command.

For information on	See
Calculating formulas and using operators	Calculation Operator
Changing a reference to relative, absolute, or mixed	References

For information on	See
Entering formulas	Formula
Entering text, numbers, dates, and times	Text Number Date Time
Error values; logical values	Error value Logical value
Formula bar techniques	Formula bar
Pasting a function into a formula	Function
Pasting a name into a formula	Names

Modes in Microsoft Excel

Microsoft Excel can be in one of several modes, depending on its current activity. For example, when you first start Microsoft Excel, the program is in Ready mode, waiting for you to select cells, enter data, or choose commands. The formula bar is not active, and the status bar at the bottom of the screen displays "Ready."

In addition to Ready mode, Microsoft Excel has three other modes — Enter, Point, and Edit — used for entering and editing data. You can use Microsoft Excel without learning about these modes. However, understanding them enables you to use the other convenient data entry and editing features built into the worksheet and formula bar.

The following descriptions outline the three data entry and editing modes and how you can use them with the keyboard or mouse.

Note The term "movement/selection keys" refers to keys such as the Direction keys (Up, Down, Left, and Right Arrow) and their related key sequences such as Shift + Direction key. This section describes the operation of the movement/selection keys as a group in each of the modes. For a table detailing how specific movement/selection keys work in each mode, see the section, "Moving and Selecting with the Keyboard," later in this topic.

Enter mode — the basic data entry mode for the active cell. In Enter mode, the formula bar is active, and movement/selection keys operate on worksheet cells. The status bar displays "Enter." Use Enter mode this way:

- To turn on Enter mode, just start typing data for the active cell, and Microsoft Excel automatically activates the formula bar in this mode.
- To erase mistakes, press Backspace. To cancel the entry, press Command+. (period).
- To complete a cell entry, press Enter or click the enter box with the mouse. If only a single cell is selected, you can press a Direction key to move as you complete the entry.

> ***Tip*** If you're typing a formula in Enter mode and you want to complete the entry by pressing a Direction key, make sure the insertion point is not placed after an operator, comma, or left parenthesis. If the insertion point is next to one of these, pressing a Direction key enters a cell reference in the formula instead of entering the formula in the cell and moving the active cell.

Point mode — a mode that simplifies entering cell and range references in a formula in the active cell. You can use Point mode only if you are first in Enter mode and only when entering a formula. In Point mode, the formula bar is active, and movement/selection keys operate on worksheet cells. The status bar displays "Point." Use Point mode this way:

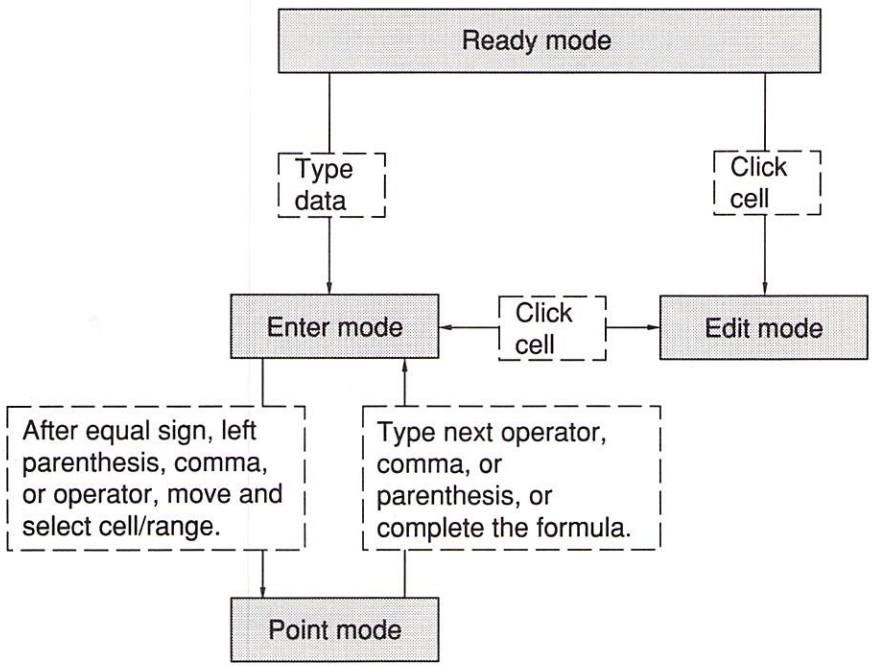
- First make sure you are in Enter mode.
- The insertion point must immediately follow an equal sign, a left parenthesis, a comma, or an operator (for example, +, −, *, or /).
- To select a cell or range whose reference you want to insert in your formula, press a movement/selection key or key sequence; with the mouse, click a cell or drag through a range. The cell or range you select is surrounded by a dotted line called the **marquee.** The reference to the cell or range appears in the formula bar.
- After you insert the reference in the formula, type the next operator, comma, or parenthesis, or complete the formula by pressing Enter or clicking the enter box.

Edit mode — a mode used for editing the contents of the active cell in the formula bar. In Edit mode, the formula bar is active, and movement/selection keys operate on characters in the formula bar. You can turn on Edit mode from Enter or Ready mode. In Edit mode, the status bar displays "Edit."

Use Edit mode this way:

- To turn on Edit mode from Ready or Enter mode, click the formula bar.
- To edit, press movement/selection keys. With the mouse, click where you want the insertion point.
- To switch to Enter mode before completing the entry, click the formula bar again.
- To complete a cell entry from Edit mode, press Enter, or click the enter box with the mouse.

The following illustration shows how the modes are related and what basic actions put each mode into effect:


Ready mode
Type data
Click cell
Enter mode
Click cell
Edit mode
After equal sign, left parenthesis, comma, or operator, move and select cell/range.
Type next operator, comma, or parenthesis, or complete the formula.
Point mode

To return to Ready mode from Enter, Edit, or Point mode, press Enter or Command+. (period).

Microsoft Excel also displays status bar messages during the following special operations:

- Copy
- Cut
- Find
- Move
- Size
- Record
- Calculate
- Help

For copy and cut operations, movement/selection keys operate as in Ready mode. For other operations, the keys have different uses.

For more information on the formula bar, status bar, and status bar messages, see **Formula bar** and **Status bar.**

Moving and Selecting with the Mouse

You can use your mouse to move and select in Microsoft Excel. The mouse performs comparable actions in a worksheet and in the formula bar:

- In the worksheet, use the mouse to move around the sheet and select the cells you want to work with when choosing a command or performing tasks such as copying or moving cells and data. To select, you click a single cell or drag through a range of cells.
- In the formula bar, click with the mouse where you want the insertion point or drag through characters to select them. Clicking in the formula bar turns on Edit mode. You can then edit a cell entry by choosing editing commands: Edit Cut, Edit Copy, Edit Paste, and Edit Clear. Or, once you've started a formula and are in Enter mode, you can easily insert a cell or range reference in the formula with Point mode. (For an explanation of the Enter, Point, and Edit modes, see the previous section in this topic, "Modes in Microsoft Excel.")

Note If you select a cell or extend a selection while in Point mode, the selection is surrounded by the dotted marquee instead of being highlighted.

The following table lists mouse procedures for moving and selecting in a worksheet:

To	Do this
Select a single cell	Click the cell you want
Select a range	Drag through the cells you want
Select one row or column	Click the row or column heading
Select many rows or columns	Drag the row or column headings
Select the entire worksheet	Click the rectangle left of the column headings
Make a multiple selection	Drag through the first selection; then hold down the Command key as you drag through each additional selection
Select in the formula bar	Click where you want the insertion point or drag through a series of characters

Tip To move within the worksheet and keep a cell or range selected, you can scroll the worksheet window using the vertical and horizontal scroll bars. For example, to scroll by row, click the arrow at either end of the vertical scroll bar; to scroll by column, click the horizontal scroll bar arrows.

Moving and Selecting with the Keyboard

Microsoft Excel has a complete set of keys for moving and selecting in a worksheet. Many keys perform parallel actions in a worksheet and in the formula bar:

- In the worksheet, you can use the keys to move around the worksheet and select the cells you want to work with when choosing a command or performing tasks such as copying or moving cells and data.
- In the formula bar, use the keys to move and select formula bar characters and edit cell entries by choosing editing commands or their corresponding shortcut keys: Edit Cut (Command+X), Edit Copy (Command+C), Edit Paste (Command+V), and Edit Clear (Command+B). Or, once you've started a formula, use the movement/selection keys with Point mode to insert cell and range references in the formula.

Note If you select a cell or extend a selection while in Point mode, the selection is surrounded by the dotted marquee instead of being highlighted.

The following table lists keys and key sequences for moving and selecting. The keys operate on worksheet cells or on formula bar characters, depending on the current mode (for an explanation of the modes, see "Modes in Microsoft Excel," earlier in this topic).

Press	In worksheet (Ready, Enter, Point modes)	In formula bar (Edit mode)
Direction key (Up, Down, Left, Right Arrow keys)	Moves one cell up, down, left, right	Moves one character up, down, left, right
Shift + Direction key	Extends selection one cell	Extends selection one character (Left/Right Arrow keys) or one line (Up/Down Arrow keys if formula bar entry exceeds one line)
Command + Direction key	Moves by one block of data left, right, up, down	Moves one word left, right, up, down
Command + Shift + Direction key	Extends selection by one block of data left, right, up, down	Extends selection one word (Left/Right Arrow keys) or one line (Up/Down Arrow keys if formula bar entry exceeds one line)
Home	Moves to start of row	Moves to start of line
Shift + Home	Extends selection to start of row	Extends selection to start of line
Command + Home	Moves to start of worksheet	Moves to start of formula bar data
Command + Shift + Home	Extends selection to start of worksheet	Extends selection to start of formula bar data
End	Moves to end of row (last occupied column of worksheet)	Moves to end of line

Press	In worksheet (Ready, Enter, Point modes)	In formula bar (Edit mode)
Shift + End	Extends selection to end of row (last occupied column of worksheet)	Extends selection to end of line
Command + End	Moves to end of worksheet	Moves to end of formula bar data
Command + Shift + End	Extends selection to end of worksheet	Extends selection to end of formula bar data
Page Up	Moves up one window	—
Shift + Page Up	Extends selection up one window	—
Page Down	Moves down one window	—
Shift + Page Down	Extends selection down one window	—
Command + Page Up	Moves left one window	—
Shift + Command Page Up	Extends selection left one window	—
Command + Page Down	Moves right one window	—
Shift + Command + Page Down	Extends selection right one window	—
Command + Shift + Spacebar	Selects entire worksheet	—

Note The Home, End, Page Up, and Page Down keys are only on the extended Macintosh keyboard.

For more information on shortcut keys for commands and on additional keys for moving and selecting, see **Keyboard.**

Getting Help

Microsoft Help is an online reference tool you can use with Microsoft Excel. Help provides information on Microsoft Excel commands, worksheet functions, concepts, basic tasks, and error messages. Help is displayed in its own window.

To get general help	To get help on a specific dialog box or message	To get help on a command
1 Choose Window Help. The Help window displays the Help topic list. 2 Click the topic you want. Microsoft Help displays that Help topic.	Press Command+/ while the dialog box or message is displayed. Microsoft Help displays the Help topic for that dialog box or message.	1 Press Command+? (Shift+/). The mouse pointer changes to a question mark. 2 Choose the command you want. Microsoft Help displays the Help topic for that command.

You can also get help on Microsoft Excel equivalents to Lotus 1-2-3 commands by clicking the Lotus 123 button, typing the Lotus 1-2-3 command in the text box, and clicking the OK button.

For complete information on using Microsoft Help, see **Help.**

Putting the Worksheet to Work

Microsoft Excel offers special capabilities related to worksheets to help put the worksheet to work for you — with tools to build accuracy and efficiency into your models. Follow the guidelines and tips here for designing a worksheet. Each discusses an appropriate Microsoft Excel tool you can use to design an effective model:

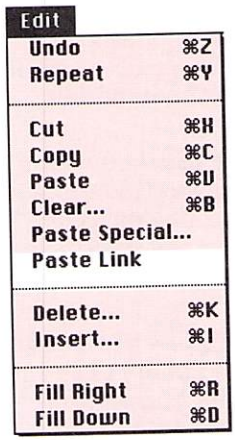
- **Sketch a visual overview of the model — the Page Preview option.** Before you enter data, think about how you want to use the worksheet. Map out your model on the screen by entering just column and row titles. Then use the Page Preview option, which shows a reduced version of the document, to check overall structure. See **Printing a document.**
- **Clarify the structure of the model — the names feature.** Use the Formula Define Name command to define names for cells, ranges, and formulas. Use the Formula Apply Names command to substitute those names in formulas. For example, the formula =F6−D6 is more clearly expressed with names: =Assets−Liabilities. Use names to make verifying references easier. See **Names.**

- **Simplify and shorten formulas to reduce errors — built-in worksheet functions.** Use built-in worksheet functions to streamline many worksheet computations. For example, the formula =D12+D13+D14+D15+D16 can be expressed with a function as =SUM(D12:D16). For an overview of worksheet functions, see **Function.** For complete information on functions, see *Microsoft Excel Functions and Macros.*
- **Streamline and add power to large, complex models — the linking feature.** You link documents with a formula in one that refers to a value in the other. The link enables Microsoft Excel to update the value when it changes. Linking simplifies data consolidation and allows you to break down a large model into compact, interdependent worksheets that are easier to use. Use linking to design versatile models for multiple users or to design modules according to the way you use them — for example, daily or monthly. See **Linking documents.**
- **Document the model — cell notes and Info window.** Use the built-in cell notes feature to document assumptions and data sources, indicate acceptable tolerances, and flag discrepancies within your worksheet model. Notes can serve as reminders for you and as orientation (especially when used with the Info window) for others using the model. See **Notes** and **Info window.**
- **Test the model — auditing tools.** Auditing tools include methods for examining relationships between cells, resolving circular references, and locating error values. If you're building a large model, use these tools on a "rapid prototype:" enter small amounts of data for each part of the model, and test them with the auditing tools to see if the model is designed correctly. See **Auditing worksheet models** and **Info window.**
- **Examine the model visually — charts.** Visualizing data in the form of a chart is another way to analyze a model and show relationships in the data. Plotting worksheet data is as easy as selecting the cells and choosing a single command. You can view charts and worksheets together on the screen — a convenient feature for quick analysis. See **Chart.**
- **Guard against accidental or unauthorized changes — protection options.** The protection options include limiting access to documents with passwords, locking or hiding cells, and locking the window layout of a worksheet. See **Protecting or hiding data.**

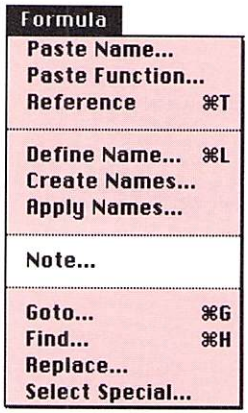
- **Automate frequently performed tasks — macros and the macro recorder.** A macro is a set of instructions you create for Microsoft Excel to follow. You can then use just a keystroke or two to carry out the macro. Use macros to automate tasks you routinely repeat, such as creating a monthly summary. Microsoft Excel will even enter the macro instructions for you with the built-in macro recorder. For a general overview of macros, see **Macro.** See *Microsoft Excel Functions and Macros* for complete information.
- **Try these other tools in your model — arrays, data tables, databases.** If you need specialized formulas that occupy ranges and return multiple results, use arrays. As shortcuts for your "what-ifs," create one- or two-input data tables. Set up a database on a worksheet, and use Data menu commands to perform all standard database operations, or use a data form to easily enter and view individual data records. See **Array, Data table,** and **Database.**

Editing a Worksheet

Editing a worksheet includes not only revising the cell contents, but also making changes in the structure or organization of a worksheet. The main commands for editing a worksheet are on these two menus (full menus shown):



- The Edit menu commands control standard editing procedures such as moving, copying, inserting, and deleting data.



- The Formula menu commands simplify creating and editing complex formulas and control procedures for naming cells and ranges, finding cells and data, or searching and replacing information.

For a description of each Edit and Formula menu command, see the corresponding command topic.

Guide to Worksheet Editing Topics

The following table lists the editing procedures you can use for Microsoft Excel worksheets. For complete information about a procedure, refer to the topic listed in the table.

Tip For a quick-reference survey of editing procedures with brief summaries of procedures rather than step-by-step procedures, see **Editing a document.**

For information on	See
Changing a reference to relative, absolute, or mixed reference	References
Clearing data or formats from cells	Deleting and clearing data
Copying data and formats	Copying data and formats
Deleting cells	Deleting and clearing data
Deleting rows and columns	Deleting and clearing data
Dividing one column into multiple columns	Values
Duplicating characters in the formula bar	Copying data and formats

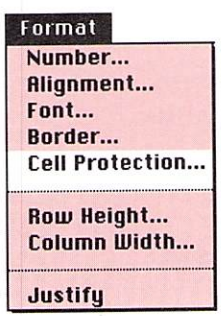
For information on	See
Editing in the formula bar	Formula bar
Finding and replacing specific data	Finding cells and data quickly
Finding specific data about cells	Info window
Moving data and formats	Moving data on a worksheet
Inserting rows and columns	Inserting blank cells
Opening multiple windows into a worksheet, splitting a worksheet window into panes, and freezing row and column titles	Windows
Pasting a function into a formula	Function
Pasting a name into a formula	Names
Replacing a formula with its value	Calculation

Formatting a Worksheet

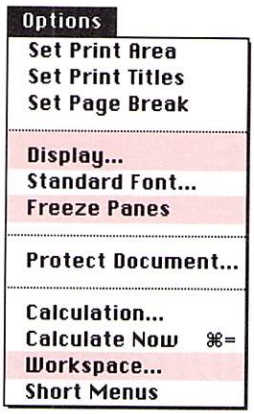
Formatting a worksheet includes changing the appearance of the worksheet data and enhancing the overall design of the document. You can format a worksheet without affecting formulas or values in cells; when you change a cell's format, its value does not change. Microsoft Excel displays the cell's value in the new format.

Microsoft Excel gives you numerous formatting options for displaying and printing out worksheets. For example, you can create custom formats for numbers and text for specialized needs. Or, you can add borders and shading to emphasize key areas.

The main worksheet formatting commands are on these menus (full menus shown):



- The Format menu commands shown tinted here control the formats of specific cells and ranges.



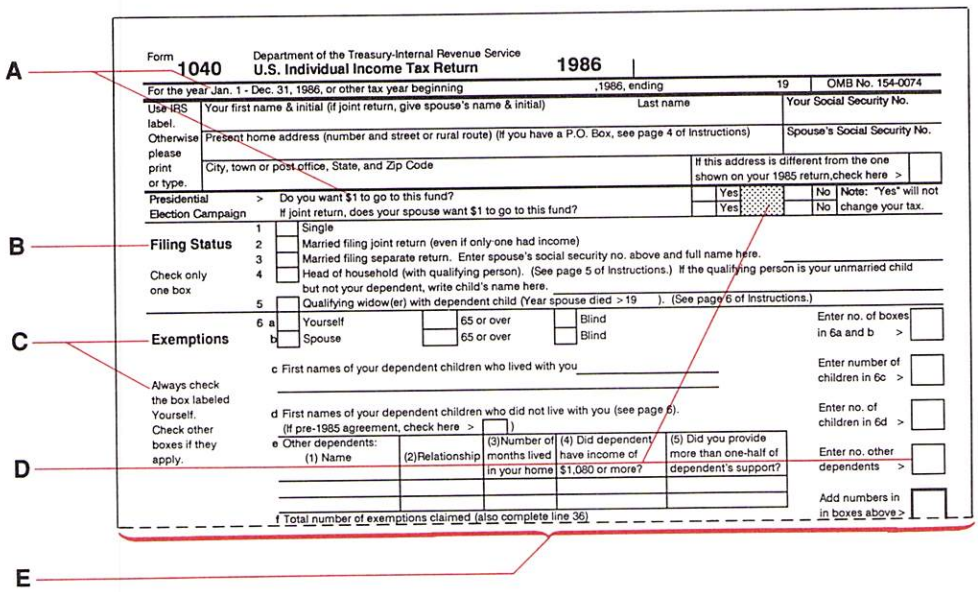
■ The Options menu commands shown tinted here control document-wide display format settings.

For a description of each Format and Options menu command, see the corresponding command topic.

Guide to Worksheet Formatting Topics

The following illustration shows examples of general worksheet formatting options. The accompanying table lists the formatting options you can use and the topics you should refer to for complete procedural information about each option.

Tip For an illustrated, quick-reference survey of formatting options with brief summaries of procedures rather than step-by-step procedures, see **Formatting a document.**


A
B
C
D
E
Form 1040
Department of the Treasury-Internal Revenue Service
U.S. Individual Income Tax Return
1986
For the year Jan. 1 - Dec. 31, 1986, or other tax year beginning ,1986, ending 19
OMB No. 154-0074
Use IRS label. Otherwise please print or type.
Your first name & initial (if joint return, give spouse's name & initial)
Last name
Your Social Security No.
Present home address (number and street or rural route) (If you have a P.O. Box, see page 4 of Instructions)
Spouse's Social Security No.
City, town or post office, State, and Zip Code
If this address is different from the one shown on your 1985 return, check here >
Presidential Election Campaign
Do you want $1 to go to this fund?
If joint return, does your spouse want $1 to go to this fund?
Yes
No
Note: "Yes" will not change your tax.
Filing Status
Check only one box
1 Single
2 Married filing joint return (even if only one had income)
3 Married filing separate return. Enter spouse's social security no. above and full name here.
4 Head of household (with qualifying person). (See page 5 of Instructions.) If the qualifying person is your unmarried child but not your dependent, write child's name here.
5 Qualifying widow(er) with dependent child (Year spouse died > 19). (See page 6 of Instructions.)
Exemptions
Always check the box labeled Yourself. Check other boxes if they apply.
6 a Yourself
65 or over
Blind
b Spouse
65 or over
Blind
Enter no. of boxes in 6a and b >
c First names of your dependent children who lived with you
Enter number of children in 6c >
d First names of your dependent children who did not live with you (see page 5).
(If pre-1985 agreement, check here >)
Enter no. of children in 6d >
e Other dependents:
(1) Name
(2) Relationship
(3) Number of months lived in your home
(4) Did dependent have income of $1,080 or more?
(5) Did you provide more than one-half of dependent's support?
Enter no. other dependents >
f Total number of exemptions claimed (also complete line 36)
Add numbers in boxes above >

For information on	See
A Standard and custom formats for numbers and text	
Using number, text, or currency formats, including color formats for display	Number
Using date and time formats	Date Time
Displaying formulas or values; hiding or displaying zero values	Display options
B Alignment formats	
Aligning text and numbers in cells	Alignment
Filling a cell or range with a repeated character or series of characters	Alignment
Justifying a paragraph of explanatory text to fit a column	Alignment

For information on	See
C Font formats	
Applying fonts to a worksheet; changing worksheet fonts	Font
Adjusting column widths or row heights	Column Row
D Border and shading formats	
Adding borders or shading to a cell or range	Borders and shading
E Print formats	
Formatting headers and footers	Headers and footers
Setting up page layout	Printing a document
Row and column heading formats	
(Example shows row/column headings hidden)	
Hiding or displaying column and row headings on the screen display or when you print	Display options Printing a document
Using the R1C1 reference style for rows and columns	References
Gridline formats	
(Example shows gridlines hidden)	
Hiding or displaying gridlines on the screen display or when you print	Display options Printing a document

Saving and Printing a Worksheet

This section covers basic procedures for saving and printing worksheets. For complete information and additional options for saving and printing worksheets, see **Saving and closing a document** and **Printing a document.**

Saving a New Worksheet

You save each worksheet as a separate document.

1. With the worksheet window active, choose File Save As.
   The dialog box displays a default name in the text box.
2. In the text box, type a document name (*TAX*, for example).
   Your document name automatically replaces the default when you start typing.
   If you want to save the worksheet in a different folder from the one specified in the dialog box, click the folder name above the list box and select the folder you want. For more information on selecting drives and folders, see **Folders.**
3. Click the OK button.

Once you've named the worksheet, you can use the File Save command whenever you want to save changes to it again. To rename the worksheet or save it in a different folder, save it with the File Save As command.

For more information on opening documents you've saved, see **Opening a document.** For more information on folders, see **Folders.**

Printing a Worksheet

Before you print:

- Select a printer, if necessary. Use the Chooser from the Apple menu to select the printer you want to use.
- Preview the worksheet. The Page Preview option in the File Print dialog box shows a reduced version of how the printed worksheet will look. You can select and view at larger scale any detail on the previewed page and make necessary page layout adjustments.

To print a worksheet:

1. With the worksheet window active, choose File Print.
2. Click the OK button.

For more information on printing and previewing a worksheet, see **Printing a document.**

Related Information

Reference

For information on	See
Chart, database, and window basics	Chart Database Windows
Editing and formatting on a worksheet	Editing a document Formatting a document
Using commands and dialog boxes	Command, menu, and dialog box

Workspace file

A **workspace file** lists the names of documents you have open in the workspace when the workspace file is saved. Saving the layout of your workspace in a workspace file is useful if you frequently work with a particular set of documents for a certain task. If you save the documents as a workspace file, you can reopen all of them together by opening one workspace file.

In addition to saving a list of all open documents, a workspace file includes:

- Position and size of all windows used for the open documents
- Options selected in the Options Workspace dialog box
- The preferred chart type
- Global calculation settings (Automatic/Manual and Iteration)
- Menu style (full or short menus)
- Info window settings

Important A workspace file is a list of documents — not the documents themselves. If you have not saved the documents on your disk, you will not be able to reopen them, even though they were open when you saved the workspace file. Do not delete a document file even if it is listed in a workspace file unless you intend to permanently delete that file.

Also, you can open any document separately, even if it is listed in a workspace file. Any changes you make to the document or to its document window size and position are retained the next time you open the document as part of the workspace file.

Saving a Workspace File (Full Menus)

1. Choose File Save Workspace.
2. In the text box, type a name for the workspace file.
3. Click the OK button.

   Microsoft Excel displays a series of messages asking if you want to save changes made to the open documents. To save the changes, click the Yes button. To cancel the changes, click the No button. To cancel the command, click the Cancel button.

Tip You might find it handy to set up several workspace files to accommodate each arrangement of windows and documents you use to begin a Microsoft Excel session. For example, you might set up one workspace file for BUDGET and another for SALES. When you want to work with a particular set of documents and windows, open the appropriate workspace file.

Opening a Workspace File (Resuming Microsoft Excel)

- From the Finder, double-click the icon for the workspace file.

Microsoft Excel starts and opens and displays the documents listed in the workspace file. Use this method to resume Microsoft Excel.

Tip To open the same workspace file every time you start Microsoft Excel, copy that workspace file into the System folder and rename it Excel Startup. Whenever you double-click the Microsoft Excel icon, Microsoft Excel starts and opens the Excel Startup file. For more information, see **Startup file.**

Opening a Workspace File from within Microsoft Excel

- Choose File Open and open the workspace file.

For information on opening documents, see **Opening a document.**

Related Information

Reference

For information on	See
Procedures for saving documents	Saving and closing a document
Startup procedures	Starting Microsoft Excel
Ending a work session	Quitting Microsoft Excel

Sampler

Consolidating Reports

Index

1-2-3 *See* Lotus 1-2-3
10-key keypad 428
1900 date system 180, 473-474, 522
1904 date system 35, 473-474, 522

A1 reference style
  absolute reference notation 5, 559
  description 202, 554
  relative reference notation 5, 559
  setting 202, 327, 558
About Excel command 4, 466
ABS function
  See also Microsoft Excel Functions and Macros
  description 373
Absolute reference
  A1 style notation 5, 559
  changing to relative/mixed reference 228, 358-359, 557
  copying data, effect on references 226
  copying formulas, effect on results 556
  description 5, 555, 559
  entering 555
  moving data, effect on references 226
  R1C1 style notation 5, 559
  recording references as 461
Absolute value 373
Accountant's keypad 428
ACOS function
  See also Microsoft Excel Functions and Macros
  description 376
Active cell *See* Cell
Active folder 286-289
Adding (mathematics)
  copy area to paste area 120-122, 219
  DSUM function procedure 178, 369
  SUM function procedure 366, 375
Address *See* Reference
Addressable memory 257-258

Alignment
  cell alignment *See herein* worksheet alignment
  centering *See* Centering
  chart alignment
    description 5
    procedures 9-10, 92, 319, 335
  footer alignment 268, 389
  header alignment 268, 389
  justifying text 7-8, 299, 324
  Lotus 1-2-3, conversion 451
  worksheet alignment
    default settings 187
    description 5
    procedures 6-8, 292, 324
Alignment command *See* Format Alignment command; Format Justify command; Format Text command
Alphabetizing *See* Sorting
Alternate menu activation key 104, 534
Ampersand (&)
  custom dialog box, underlining characters 164
  header/footer codes 268-269, 389-390
  text operator 338, 516
AND function
  See also Microsoft Excel Functions and Macros
  description 372
AppleTalk network 541
Application
  See also specific application
  description 286
  development 255-256, 455
  exchanging data between *See* Exchanging data between applications
  maximum number running at one time 258
Arccosine 376
Arcsine 376
Arctangent 376
Area chart
  See also Chart
  creating 301, 377

Area chart *(continued)*
description 45
overlay chart, use as 309
AREAS function
See also Microsoft Excel Functions and Macros
description 371
Argument
array arguments 14, 20-23
function arguments *See* Function
series formula arguments 576-577
Arithmetic operators 5, 338, 516
Array
arguments 14, 20-23
constant 10, 18-20
determinant, calculating 374
dimension
description 16
expanding the dimension 20-23
formula *See* Array formula
inverse, calculating 374
Lotus 1-2-3, conversion 447
multiplying arrays 374
number of columns in array 371
number of rows in array 372
pasting arrays 217
range *See* Array range
relative references 14
searching for/selecting 283-284, 362
transposing 374
types of arrays 10
Array formula
arguments 14, 20-23
description 12
displaying in formula bar 13
editing 17-18
entering into worksheet 13-14, 424
overview 12-13
relative references 14
result array
displaying in array range 16
expanding/trimming the dimension 21-22
multiple results 15
Array range
clearing 18
converting to constant values 18
description 10
editing 17-18
formatting 18
overview 11-13
result array, displaying in 16
Arrow *See* Chart
Arrow command *See* Chart Add Arrow command; Chart Delete Arrow command
Arrow keys *See* Direction keys; Down Arrow key; Left Arrow key; Right Arrow key; Up Arrow key
ASCII character, returning from ASCII code 375
ASCII code, returning from ASCII character 375
ASIN function
See also Microsoft Excel Functions and Macros
description 376
Asterisk (*)
arithmetic operator 338, 516
number format, filling in characters 307
searching for 161, 170, 354, 604
wildcard character 135, 161, 170, 353, 602-603
At sign (@), number format, text placeholder 307, 512
ATAN function
See also Microsoft Excel Functions and Macros
description 376
ATAN2 function
See also Microsoft Excel Functions and Macros
description 376
Attached text *See* Chart text
Auditing worksheets 24-28, 251
Automatic calculation *See* Calculation
Automatic tiling 406, 625
Available memory *See* Memory
AVERAGE function
See also Microsoft Excel Functions and Macros
description 366, 374
Averaging numbers
AVERAGE function procedure 366, 374
DAVERAGE function procedure 178, 369
Axis
See also Chart object
category axis *See* Category axis
colors, setting 64-65, 312
default settings 190
description 42, 60
displaying in chart 60
formatting
Format Font command procedure 64-65
Format Patterns command procedure 64-65, 312, 332
Format Scale command procedure 64-65, 315-318
horizontal axis *See* Category axis
intersection point, setting 315-318, 333

Axis *(continued)*
line
style, setting 64, 312
weight, setting 64, 312
number per chart 61
overlay chart, adding/deleting axes 60, 537
patterns, setting 312
scale, setting 315-318, 333
tickmark labels
default settings 191
deleting 313
description 42
editing 62
formatting 62, 64, 332, 335
positioning 64, 313
tickmarks
description 42
formatting 64, 313, 332
overlay charts, reformatting 537
value axis *See* Value axis
vertical axis *See* Value axis
x-axis *See* Category axis
y-axis *See* Value axis

Background calculation 32
Background colors/patterns *See* Chart; Chart text
Background processing 386
Backing up documents
default settings 187
File Save As command procedure 276-277
Backslash (\), displaying characters in number format 307
Backspace key
characters, deleting
in formula bar 346
in text box 109
chart text, deleting 94, 196, 234
data series, deleting 77, 196, 235
formula bar, activating 347
Bar chart
category axis 61
creating
Format Main Chart command procedure 301
Format Overlay Chart command procedure 309
Gallery Bar command procedure 378
description 45
overlay chart, use as 309

Bar chart *(continued)*
series markers, formatting
Format Main Chart command procedure 75-77, 301-302
Format Overlay Chart command procedure 75-77, 309-310
Format Patterns command procedure 75-77
Gallery Bar Chart command procedure 378
value axis 61
BIFF 473
Binary Interchange File Format 473
Bitmap format, Clipboard type identifier 256
Blank cell *See* Cell
Bold format
footers, formatting 268, 389
headers, formatting 268, 389
selection, formatting 297
standard font, formatting 530
Border
cell borders *See herein* worksheet borders
chart borders, formatting 82, 83, 312
chart text borders
automatic sizing 319
formatting 91-92
worksheet borders
creating 29-30, 293, 325
default settings 187
deleting 30
special effects, creating 560
use suggestions 28
Braces ({})
array constant, notation 19
array formula, notation 13
Brackets ([ ]), parse line, notation 133
Built-in settings *See* Default settings

Calculation
automatic calculation
Automatic Except Tables option 33, 142, 521
setting 33, 521
background calculation 32
custom calculation macros 455
dates 180, 574
default settings 187
description 31, 520
features 251
iteration *See* Iteration
Lotus 1-2-3, conversion 450

Calculation *(continued)*
manual calculation
Chart Calculate Now command procedure 34, 66
Options Calculate Document command procedure 34, 519
Options Calculate Now command procedure 34, 519-520
setting, Options Calculation command procedure 521
message 585
order of calculation 415
overview 32-33
Precision As Displayed *See* Precision As Displayed
procedure
Chart Calculate Now command 34, 66
Options Calculate Document command 34, 519
Options Calculate Now command 34, 519-520
tables, Automatic Except Tables option 33, 142, 521
times 574, 591
Calculation commands *See* Chart Calculate Now command; Options Calculate Document command; Options Calculate Now command; Options Calculation command
Cancel box 617
Canceling
command selection 104
formulas 340, 345
iteration 111
print titles 544
printing 547
Capital letters
creating, UPPER function procedure 376
initial capitals, converting to 375
names, use in 487
searching, effect on 153
sorting, effect on 153
Caret (^), arithmetic operator 338, 516
Categories argument 577
Category axis
See also Axis
attaching text *See* Chart text
bar chart differences 61
description 42
formatting 64-65, 316
labeling 59
Cell
absolute reference *See* Absolute reference
active cell
description 631
displaying 365
information about *See* Info window
Move Selection After Return option 534
address *See* Reference
alignment *See* Alignment
blank cells
determining, ISBLANK function procedure 371
effect on line charts/scatter charts 68
inserting into worksheet 214, 410-411
justifying text, effect 299
searching for/selecting 283, 362
sort order *See* Sorting
borders *See* Border
calculation *See* Calculation
checking relationships between cells 26
clearing 195, 205-206, 232-233
contents
clearing 195, 205-206, 233
editing 227
length specifications 252
copying *See* Copying
counting nonblank cells 178, 369
current cell *See herein* active cell
cutting from worksheet 210
defined 626, 631
deleting
Edit Delete command procedure 195, 211, 233
effect on formulas referring to deleted cell 232
undoing deletion 194
display options, default settings 188
entering data
Enter mode 339, 640
error values 637
formulas *See* Formula
guidelines 636-638
logical values 637
message 586
numbers 505, 636-637
procedure 632-634
text 589, 637
types of data 635-636
filling in cells
Data Series command procedure 133-134, 600
Edit Fill Down command procedure 212, 229

Cell *(continued)*
filling in cells *(continued)*
Edit Fill Left command procedure 212, 229
Edit Fill Right command procedure 213, 229
Edit Fill Up command procedure 213, 229
Format Alignment command procedure 6-7, 292, 324
finding *See* Searching
formatting *See specific type of formatting*
height *See* Row
hiding 295
information about 371
input cell 139
jumping to 230, 281, 354-355
last cell containing data, searching for 364
linking to chart text 89-91
locking *See* Protecting documents
moving
references, effect on 226, 482, 484
to another place in worksheet 210, 230, 484-485
to another worksheet 230, 484-485
multiple selections *See* Multiple selections
named cells *See* Name
naming cells
Formula Create Names command procedure 349-350, 489
Formula Define Name command procedure 350-353, 487
nonblank cells, counting 178, 369
notes *See* Note
printing *See* Printing
protection *See* Protecting documents
reference *See* Reference
relative reference *See* Relative reference
searching for 230, 280-285, 353-354, 361-364
selecting
Formula Goto command procedure 230, 281, 354-355
Formula Select Special command procedure 283, 361-364
keyboard procedure 419-420, 643-645
mouse procedure 573, 642-643
table of cells *See* Table
width *See* Column
CELL function
See also Microsoft Excel Functions and Macros
description 371
Cell notes *See* Note
Centering
cell contents 7, 292
footers 268, 389
headers 268, 389
CHAR function
See also Microsoft Excel Functions and Macros
description 375
Chart
See also specific type of chart
alignment *See* Chart text
area *See* Chart area
area chart *See* Area chart
arrows
adding to chart 55, 57, 331
deleting from chart 58, 78
formatting 58, 312, 314, 331
moving 57
sizing 57
Automatic setting 189
axis *See* Axis
background *See* Chart area
bar chart *See* Bar chart
borders, formatting 82, 83, 312
built-in charts *See herein* types of charts
clearing 206
cluster spacing 302
color
display options 96
number of available colors 254
setting 312
column chart *See* Column chart
combination chart *See* Combination chart
copying charts *See* Data series
creating new charts
File New command procedure 38-39, 263-264
multiple selections, creating from 71-73
series formula procedure 578-579
customizing charts 48-53
data series *See* Data series
default settings 189-191
deleting data from chart 195-196
description 36, 41
drawing *See* Plotting charts
drop lines 301
editing 233-235
features 253
fonts *See* Font
footers *See* Footer

Chart *(continued)*
formatting
changing after customizing 51-52
clearing 206, 366
customizing charts 48-53
Format Main Chart command procedure 301-302
Gallery Menu commands procedure 47, 329
guidelines 329-330
replacing with format of another chart 75, 123-124, 207, 221
formula *See* Series formula
Gallery menu commands override custom formats 46, 52
gridlines *See* Gridlines
headers *See* Header
hi-lo lines 302
legend
See also Chart object
adding to chart 55, 81, 333
data series name 42, 89, 234
default settings 190
deleting from chart 79, 83
description 42, 81
formatting 82, 333
label *See herein* data series name
moving 81, 300
positioning 81, 300
shadowing 313
source of text 81
text, formatting 82, 336
line chart *See* Line chart
lines
default settings 191
styles/weights, number of 254
styles/weights, setting 312
linking to worksheet
automatic links 429
maximum number of links 254
Lotus 1-2-3, conversion 446
margins *See* Margin
moving to Microsoft File 247-248
multiple selections, plotting chart from 71-73
naming chart documents 53
new charts *See herein* creating new charts
objects *See* Chart object
overlay chart *See* Overlay chart
page setup 270, 541-542

Chart *(continued)*
patterns
default settings 190
setting 310-313
pie chart *See* Pie chart
plot area
description 42, 83
formatting 83, 332
selecting 43, 86
plotting *See* Plotting charts
preferred chart format
changing 52, 384
changing chart to 52, 383
saving settings 53, 384
previewing 53
printing 53-54, 273
protection
turning off 95, 551
turning on 84-85, 551
quick analysis techniques 48
saving 53
scatter chart *See* Scatter chart
selecting 43, 85
selection 572
sizing 270
specifications 254-255
summary chart 73
text *See* Chart text
tickmark *See* Axis
title 59, 88
types of charts 36, 44-46
updating references to nonresident sheets 90
XY chart *See* Scatter chart
Chart Add Arrow command 55, 57, 331
Chart Add Legend command 55, 81, 333
Chart Add Overlay command 56, 333, 535-536
Chart area
description 56
formatting
number of available patterns 254
procedure 56, 312, 333
Chart Attach Text command
attaching text to charts 59-60, 88, 334
description 59-60
series marker, labeling 335
Chart Axes command 60
Chart Calculate Now command 33, 34, 66
Chart Delete Arrow command 58, 78

Chart Delete Legend command 79, 83
Chart Delete Overlay command 79, 538
Chart Full Menus command 80, 105
Chart Gridlines command 63, 80, 332
Chart menus
  designated 103
  menu bar 41, 470
Chart object
  See also specific chart object
  classes of chart objects 42-43
  formatting
    Format Patterns command procedure 310-314
    guidelines 331-333
  label *See* Chart text
  moving 44, 302
  moving to 42-43
  selecting 42-44
  selection squares 44
  sizing 44, 318
  types of chart objects 42-43
Chart Protect Document command 84-85, 551
Chart Select Chart command 43, 85
Chart Select Plot Area command 43, 86
Chart Short Menus command 86, 105
Chart text
  See also Chart object
  alignment
    description 5
    procedures 9-10, 92, 319, 335
  attached text
    attaching to chart 59-60, 88, 334
    deleting from chart 94, 196, 234
    description 42, 87, 233
    editing 59, 88, 91, 234
    formatting 91-92, 319, 334-336
    replacing with data point value 319
  background, formatting 92, 298
  borders
    automatic sizing 319
    formatting 92
  color, setting 298, 335
  deleting from chart 94, 196, 234
  description 42, 87
  editing 91, 233-234
  fonts *See* Font
  formatting 64, 91-92, 319, 334-336
  legend text
    formatting 82, 336
    source of text 81
  line breaks 88, 89
Chart text *(continued)*
  linking to worksheet 89-91
  replacing with data point value 319
  shadowing 313
  types of chart text 87
  unattached text
    adding to chart 89, 334
    deleting from chart 94, 196, 234
    description 42, 87, 233
    editing 91, 234
    fonts *See* Font
    formatting 91-92, 319, 334-336
    moving 93, 334
    positioning 93, 334
    sizing text area 93-94
  white out area 298
Chart Unprotect Document command 95, 551
Chart window
  description 40
  moving in 42-44
  parts of a chart window 41-42
  selecting in 42-44
Check box
  description 107
  grayed check box 110
CHOOSE function
  See also Microsoft Excel Functions and Macros
  description 373
Chooser command 541
Circular reference
  calculating *See* Iteration
  description 95-96, 412
  message 585
CLEAN function
  See also Microsoft Excel Functions and Macros
  description 375
Clear command *See* Edit Clear command
Clear key 104
Clearing
  array ranges 18
  cells 195, 205-206, 232-233
  charts 206, 336
  data series 206, 336
  deleting/clearing differences 194, 205-206, 232
  description 194, 232
  extract range 177
  formulas 205, 229
  notes from cells 195, 205
  values in tables 146

Clipboard
closing Clipboard window 607
contents, displaying 242, 607
copying data 242-243
supported formats 256
Closing
Clipboard window 607
documents
description 565
File Close All command procedure 258, 566
File Close command procedure 259, 565-566, 626
Help window 605
Info window 404
Cluster spacing
main charts 302
overlay charts 310
CODE function
See also Microsoft Excel Functions and Macros
description 375
Colon (:)
displaying in number 307
printing 268
reference operator symbol 338, 517
Color
chart axis colors 64-65, 312
chart colors
display options 96
number of available colors 254
series markers, setting color 75-76, 301, 309, 332
setting 312
chart text, setting 298, 335
column heading colors, setting 202, 325, 524
default settings 188
display options 96
font colors 290, 297, 530
gridline colors, changing 202, 325, 524
maximum number per worksheet 252
number format colors, setting 308, 323, 508, 512
options 96
row heading colors, setting 202, 325, 524
tickmark label colors, setting 64
Column
chart *See* Column chart
data exceeding column width, displaying 506, 638
Column *(continued)*
deleting
Edit Delete command procedure 99, 195, 232
effect on references 226
description 97
differences, searching for 363-364
discontinuous columns
changing widths 98-99
selecting 98
displaying hidden columns 100
dividing into multiple columns *See herein* parsing
double column lines 30
filling in *See* Filling in
heading *See* Column heading
hiding
displaying hidden columns 100
procedure 99
inserting into worksheet
Edit Insert command procedure 99, 214, 232, 410-411
effect on references 226
labeling
A1 reference style 97
R1C1 reference style 97, 557
multiple columns
parsing 132-133, 232
selecting 98
widths, setting 98-99
naming 349-350, 489
number of columns in array 371
number per worksheet 97
numbers, determining 371
parsing 132-133, 232
print titles *See* Print titles
searching through 282, 354
selecting
discontinuous columns 98
keyboard procedure 420
mouse procedure 98, 643
sorting 136-138, 580-582
titles *See* Column title
width
data exceeding column width, displaying 97, 506, 638
default settings 97, 187
fonts, adjusting width for 530
setting 8, 97-99, 295, 326
specifications 252

Column chart
creating
Format Main Chart command procedure 301
Format Overlay command procedure 309
Gallery Column command procedure 379
default chart type 39, 52, 190
description 45
overlay chart, use as 309
series markers, formatting
Format Main Chart command procedure 301-302
Format Overlay command procedure 308-310
Format Patterns command procedure 75-77
Gallery Column command procedure 379
Column delimiter 265
COLUMN function
See also Microsoft Excel Functions and Macros
description 371
Column heading
colors 202, 325, 524
default settings 188, 189
description 631
displaying/hiding
printing display 202, 269, 329, 541
screen display 201, 327, 523
Column title
freezing 227, 327, 422, 524, 624-625
printing 528-529, 543-544
COLUMNS function
See also Microsoft Excel Functions and Macros
description 371
Combination chart
See also Overlay chart
creating 380
description 46
Comma (,)
column delimiter 265
number, thousands separator symbol 306, 511
reference operator symbol 338, 517
Comma Separated Values format (CSV) 256, 276
Command
See also specific command
changed commands 478
choosing 104, 422
description 101
dialog box *See* Dialog box
dimmed commands 106
formula bar, commands available when active 638
function keys, command shortcuts 426-427
Command *(continued)*
grayed commands 106
groupings 101
Help information 104, 392-393
keyboard shortcuts 422-427
mnemonics, default settings 188
naming conventions 101
new commands 476-477
repeating 222, 224-225
shifted commands 106
shortcut keys 423-427
underlines, turning on/off 534
undoing 223, 224
Command button 107
Command key combinations
Command+: (colon), entering time into formula bar 347
Command+= (equal sign), Options Calculate Now command, key combination 424
Command+. (period)
command selection, canceling 104, 418
Data Find, exiting 175
formula bar entries, canceling 340, 345
iteration, canceling 111
printing, canceling 547
Command+? (question mark), requesting Help 393, 418
Command+" (quotation marks), copying value into formula bar 347
Command+' (right single quotation mark), copying formula into formula bar 347
Command+; (semicolon), entering date into formula bar 347
Command+/ (slash), requesting Help 393, 418
Command+A
Chart Select Chart command key combination 423
selecting worksheets 420
Command+B, Edit Clear command key combination 423
Command+C, Edit Copy command key combination 346, 423
Command+D, Edit Fill Down command key combination 424
Command+Direction keys, moving in worksheet/formula bar 419, 644
Command+the Down Arrow key, moving in page preview 546
Command+E, Data Extract command key combination 423

Command key combinations *(continued)*
Command + End key, moving in worksheet/formula bar 420, 645
Command + Enter, array formula, entering into worksheet 13, 14, 424
Command + F, Data Find Next command key combination 175, 423
Command + F2, Window Show Info command key combination 426
Command + F3, Formula Define Name command key combination 426
Command + F4, File Close command key combination 427
Command + F5, restoring window size 427
Command + F6, moving between windows 427
Command + F7, moving windows 427
Command + F8, sizing windows 427
Command + F10, enlarging windows 427
Command + F11, File New command key combination 427
Command + F12, File Open command key combination 427
Command + G, Formula Goto command key combination 424
Command + H, Formula Find Next command key combination 282, 424
Command + Home key, moving in worksheet/formula bar 420, 644
Command + I, Edit Insert command key combination 424
Command + J, Formula Find command key combination 424
Command + K, Edit Delete command key combination 424
Command + L, Formula Define Name command key combination 424
Command + the Left Arrow key, moving in page preview 546
Command + N, File New command key combination 424
Command + O, File Open command key combination 424
Command + P, File Print command key combination 424
Command + Page Down key, moving right one window 645
Command + Page Up key, moving left one window 645
Command + Q, File Quit command key combination 424

Command key combinations *(continued)*
Command + R, Edit Fill Right command key combination 424
Command + Return
breaking lines in chart text 88, 89
entering formula as array 424
Command + the Right Arrow key, moving in page preview 546
Command + S, File Save command key combination 424
Command + Shift + / (slash), requesting Help 393, 418
Command + Shift + C, Edit Copy Picture command key combination 423
Command + Shift + D, Edit Fill Up command key combination 424
Command + Shift + Direction key, extending selection 419, 644
Command + Shift + End, extending selection 420, 645
Command + Shift + F, Data Find Previous command key combination 423
Command + Shift + F3, Formula Create Names command key combination 426
Command + Shift + F6, moving between windows 427
Command + Shift + F12, File Print command key combination 427
Command + Shift + H, Formula Find Previous command key combination 424
Command + Shift + Home, extending selection 420, 644
Command + Shift + N, Formula Note command key combination 424
Command + Shift + R, Edit Fill Left command key combination 424
Command + Shift + S, File Save As command key combination 424
Command + Shift + Spacebar, selecting worksheets 420, 645
Command + Shift + V, Edit Paste Special command key combination 424
Command + Spacebar, selecting columns 420
Command + T, Formula Reference command key combination 228, 424
Command + Tab, moving among ranges 361
Command + U, activating formula bar 424
Command + the Up Arrow key, moving in page preview 546

Command key combinations *(continued)*
Command+V, Edit Paste command key combination 346, 424
Command+W, File Close command key combination 424
Command+X, Edit Cut command key combination 346, 423
Command+Y, Edit Repeat command key combination 424
Command+Z, Edit Undo command key combination 424
Command macro
See also Macro
description 455
recording 274, 456-457, 461-465
running 457-458
shortcut keys 353, 428, 457, 462
Comments *See* Note
Comparison criteria *See* Criteria
Comparison operator
description 516
matching criteria 161, 170-171
types, designated 170, 338, 516
Computed criteria *See* Criteria
Computed field 151
Constant value
array constant values 10, 18-20
constant number, defined 504
defined 635
description 110, 361
searching for/selecting 283, 361-362
Context-sensitive Help 392-393
Control characters, removing from text 375
Control key combinations
Control+Page Down, moving in database 131
Control+Page Up, moving in database 131
Convergence 111, 414-415
Converting values 598-599
Copy command *See* Edit Copy command
Copying
charts 123-124, 207, 221
copy area
combining with paste area 120-122, 219, 230
defined 112, 226
data between applications
Clipboard procedure 207, 242-243
Scrapbook procedure 242, 243-244
data in worksheets
commands used 112
Copying *(continued)*
data in worksheets *(continued)*
description 115
Edit Copy/Edit Paste commands procedure 115-116, 207, 228
Edit Copy/Edit Paste Special commands procedure 118, 207, 218-219
mixed references, effect on 112-114, 226
named cells/ranges, effect on 114
relative references, effect on 112-114, 226
to adjacent cells 117-118, 229
to another place in worksheet 115-116, 229
to another worksheet 115-116, 229
to multiple paste areas 116-117, 216, 229
transposing data 119-120, 219
data series
from chart to chart 74-75, 123-124, 207, 216, 217, 221
from worksheet to chart 73-74, 207, 216-217, 220-221
filling in procedure 117-118, 229
formats
chart formats 123-124, 221
worksheet formats 118, 219
formulas
between cells 118, 219, 229
into formula bar 122, 207, 347
marquee 115
message 586
nonblank cells only 119-120, 219
notes 118, 219, 229
overview 111
pictures to Clipboard 208-209, 243
specific cell attributes 118, 219, 229
values between cells 118, 219, 229
COS function
See also Microsoft Excel Functions and Macros
description 376
Cosine 376
COUNT function
See also Microsoft Excel Functions and Macros
description 374
COUNTA function
See also Microsoft Excel Functions and Macros
description 374
Counting
characters, LEN function procedure 366, 375
nonblank cells, DCOUNTA function procedure 178, 369

Counting *(continued)*
numbers
COUNT function procedure 374
DCOUNT function procedure 178, 369
values, COUNTA function procedure 374
Cover page, printing 271
Criteria
combining criteria 172-173
comparison criteria
combining with computed criteria 172-173
description 151
entering into criteria range 168
finding database records 169-171
computed criteria
cannot specify in data form 162
combining with comparison criteria 172-173
description 151
entering into criteria range 168
finding database records 171-172
description 151
entering into criteria range 168
formula criteria *See herein* computed criteria
matching criteria
comparison criteria method 169-171
computed criteria method 171-172
Data Find command procedure 128, 174
Data Form command procedure 132, 161-162
extracting found records *See* Extracting records from database
matching all records 135, 173
matching values exactly 169, 170
names 167
range *See* Criteria range
Criteria range
blank rows, effect 125, 135, 173
creating 167-168
criteria names 167
data form criteria, independent of 129, 157, 166
defining 135, 168
description 135, 151, 166
displaying in separate window 168
located on another worksheet 135
location on worksheet, tips 167
naming 135, 168
setting up 166-173
wildcards, use in 135
CSV format 256, 276
Currency formatting
DOLLAR function procedure 375
Format Number command procedure 307, 322
Current cell *See* Cell
Custom charts 48-53
Custom data form 129, 163-166
Custom Help 166
Cut command *See* Edit Cut command
Cutting data
See also Deleting; Moving
cut area 226, 482
deleting/cutting differences 210
message 586
procedure
Command+X procedure 346
Edit Cut command procedure 210, 482

Daisywheel printer 540
Data
See also specific type of data
chart data series *See* Data series
entering into cell *See* Cell
moving in a worksheet 481-485
searching for 230, 280-285, 353-354, 361-364
types of data 635
Data Delete command 125, 176
Data Exit Find command 126, 175
Data Extract command 126-127, 176-177
Data Find mode
exiting 126, 128, 175
message 586
scrolling in 175
Data Find command 128, 174
Data form
criteria
independent of criteria range 129, 157, 166
specifying 161-162
customizing 129, 163-166
description 154
exiting 132, 160, 162
moving in database 130-131, 159
parts of a data form 157-159
records
adding to database 160
deleting from database 131, 161
editing 130, 159-160
searching for 132, 161-162
Data Form command
criteria
independent of criteria range 129, 166
specifying 162
description 129-132

Data Form command *(continued)*
records
adding to database 160
deleting from database 131, 161
editing 130, 159-160
searching for 132, 162
Data Interchange Format (DIF)
Clipboard type identifier 256
saving files 276
Data menu commands
See also specific database command
using with database 154-155
Data Parse command
description 132-133
parsing data 132-133, 232, 601-602
undoing 223
Data point
attaching text *See* Chart text
description 41, 67
formatting *See* Data series
labeling *See* Chart text
maximum number per chart 254
maximum number per data series 254
replacing chart text with data point value 319
Data series
See also Chart object
attaching text *See* Chart text
clearing 206, 336
copying
from chart to chart 74-75, 123-124, 207, 216, 217, 221
from worksheet to chart 73-74, 207, 216-217, 220-221
defining data series 68-70
deleting from chart
Backspace key procedure 77, 196, 235
Edit Clear command procedure 206, 336
description 41, 66
distribution between main chart/overlay chart 56, 310, 380, 537
editing 234
formatting *See herein* series markers
formula *See* Series formula
labeling *See* Chart text
marker *See herein* series marker
maximum number per chart 254
name 42, 89, 234
plotting
default settings 191
plot order, changing 235, 310, 537
Data series *(continued)*
series formula *See* Series formula
series markers
description 41
formatting 75-77, 301-302, 309-310, 332
labeling 335
single data series per pie chart 45, 47, 382
Data Series command 133-134, 232, 599-600
Data series name 42, 89, 234
Data Set Criteria command 135, 168
Data Set Database command 136, 153
Data Sort command 136-138, 581
Data table *See* Table
Data Table command
description 148
one-input table, creating 141, 148
two-input table, creating 144-145, 148
Database
blank row at bottom, effect 153, 156
creating 152-153
defining database range 136, 152-153, 157
description 148
editing 130, 156, 159-160
extracting records from *See* Extracting records from database
features 251
field *See* Field
formatting 156-157
form *See* Data form
Lotus 1-2-3, conversion 452
methods for working with a database 154-155
moving in 130-131, 159
organizing 152
parts of a database 150-151
range *See* Database range
records *See* Record
searching for records *See* Record
setting up 136, 152-153, 157
size limitations 153
sorting 138, 581
terms 150-151
use suggestions 149
Database form *See* Data form
Database function
See also Microsoft Excel Functions and Macros
description 155, 178, 369-370
Database range
defining 136, 152-153, 157
description 151

Date
1900 date system 180, 473-474, 522
1904 date system 35, 473-474, 522
automatic formats 305
built-in formats
applying 181-182, 322
display in formula bar 182
list of 180, 305
number of 252
troubleshooting 181-182
calculating dates 180, 574
custom formats 183-185, 307, 322
entering into formula bar 347
footer, including date in footer 268, 389
header, including date in header 268, 389
serial numbers
converting date to 370
default settings 187
description 180
series 134, 599-600
DATE function
See also Microsoft Excel Functions and Macros
description 370
Date functions
See also Microsoft Excel Functions and Macros
listing of 370
Date series 134, 599-600
DATEVALUE function
See also Microsoft Excel Functions and Macros
description 370
DAVERAGE function
See also Microsoft Excel Functions and Macros
description 178, 369
Day
converting serial number to 370
formatting symbols 183, 307-308
DAY function
See also Microsoft Excel Functions and Macros
description 370
DBF 2 file format 276
DBF 3 file format 276
DCOUNT function
See also Microsoft Excel Functions and Macros
description 178, 369
DCOUNTA function
See also Microsoft Excel Functions and Macros
description 178, 369
DDB function
See also Microsoft Excel Functions and Macros
description 370
Decimal point
default settings 192
fixed decimal places, setting 428, 533
formatting 306
Default settings
chart default settings 189-191
description 186
macro sheet default settings 186-189
worksheet default settings 186-189
workspace default settings 192
Define Name command *See* Formula Define Name command
Defined term *See* Help
Deleting
See also Cutting data
arrows from chart 58, 78
borders 30
cells
Edit Delete command procedure 195, 211, 233
effect on formulas referring to deleted cell 232
undoing deletion 194
characters, Backspace key procedure 109, 346
chart formats from chart 336
chart text from chart 94, 196, 234
clearing/deleting differences 194, 205-206, 232
columns
effect on references 226
from worksheet 99, 195, 232
control characters 375
custom date formats 185
custom number formats 197, 303, 509
custom time formats 596
cutting/deleting differences 210
data series
Backspace key procedure 77, 196, 235
Edit Clear command procedure 206, 336
dates, custom format 185
description 194, 232
documents
File Delete command procedure 193, 196, 260-261
retrieving from memory 193, 261
Edit Cut command procedure 210
fonts 530
formula bar contents 347
gridlines from chart 63, 80
legends from chart 79, 83
links between worksheets 440-441

Deleting *(continued)*
names 196, 352, 489
notes 197, 356, 501
number, custom formats 197, 303, 509
overlay chart 79, 538
overlay chart axes 537
page breaks 527, 543
records from database
all records at once 125
criteria *See* Criteria
Data Delete command procedure 125, 176
Data Form command procedure 131, 161
rows
effect on references 226
from worksheet 195, 232, 561
shading 30
spaces from text 376
tables 147
tickmark labels 313
time formats, custom 596
Delimiter
comma/tab delimiters 265
file format *See* Comma Separated Values format
Dependent cell
checking relationships 26
description 26, 285, 397
direct dependent cell 406
displaying in Info window 397, 405, 406
identifying 27
indirect dependent cell 406
searching for 27, 285, 364
Dependent variable *See* Value axis
Dependent worksheet 431
Depreciation, calculating 370
Dialog box
customizing 164, 166
description 106
grayed options 109-110
Help, displaying 392-393
keyboard, using in dialog box 109, 425-426
mouse, using in dialog box 108
moving 351
parts of a dialog box 106-107
shortcut keys 423-427
Dialog Editor 165
DIF file format
Clipboard type identifier 256
saving files 276
Dimmed command *See* Command
Direction keys
See also Down Arrow key; Left Arrow key; Right Arrow key; Up Arrow key
chart text
moving unattached text 93
sizing text area 94
chart window, moving in 43
description 417
designated 3
extending the selection 420
general use 418
Help, moving in 395
page preview, moving in 546
worksheet, moving in 419, 644
Disk drive 286
Display command *See* Options Display command
Display options
default settings 188
description 197
macro sheet display options 198-202
worksheet display options 198-202
workspace display options 202-204
#DIV/0! error value 236
Divergence 204, 414-415
Dividing (mathematics)
paste area by copy area 120-122, 219
remainder, calculating 373
DMAX function
See also Microsoft Excel Functions and Macros
description 178, 369
DMIN function
See also Microsoft Excel Functions and Macros
description 178, 369
Document
backing up
default settings 187
File Save As command procedure 276-277
calculating *See* Calculation
closing
description 565
File Close All command procedure 258, 566
File Close command procedure 259, 565-566, 626
creating new documents 263-264, 513
deleting from disk
File Delete command procedure 193, 196, 260-261
retrieving from memory 193, 261
description 286
editing 223-235

Document *(continued)*
exchanging documents between applications 244-249
footer, including document name in footer 286, 389
formatting 320-336
header, including document name in header 286, 389
linking *See* Linking documents
list of open documents *See* Workspace file
mailing documents *See* Microsoft Mail
multiple documents, viewing simultaneously 226
name
description 286
including in header/footer 268, 389
naming
File Save As command procedure 274-275, 514
guidelines 563-564
network guidelines 495-496
opening
documents created in other applications 245
documents in workspace file 656
File Open command procedure 264-266, 514
maximum number open at one time 258
multiple documents at one time 278-279, 656
page setup *See* Page setup
previewing *See* Page preview
printing *See* Printing
protecting documents *See* Protecting documents
read-only documents 262, 265, 495
read-write documents 495
saving *See* Saving
supporting documents *See* Linking documents
switching between documents, keyboard procedure 428
window *See* Window
workspace file *See* Workspace file
Document window
See also Window
defined 612
DOLLAR function
See also Microsoft Excel Functions and Macros
description 375
Dollar sign ($)
absolute references, notation 5, 559
Dollar sign ($) *(continued)*
formatting numbers
DOLLAR function procedure 375
Format Number command procedure 307, 322
typing in cell 505
Dot matrix printer 540
Double-declining balance 370
Double underline, creating 30, 294
Down Arrow key
See also Direction keys
chart window, moving in 43
database, moving in 131
DPRODUCT function
See also Microsoft Excel Functions and Macros
description 178, 369
Drive, description 286
Drop lines
See also Chart object
line charts 76
main chart 301
overlay chart 309
DSTDEV function
See also Microsoft Excel Functions and Macros
description 178, 369
DSTDEVP function
See also Microsoft Excel Functions and Macros
description 178, 369
DSUM function
See also Microsoft Excel Functions and Macros
description 178, 369
DVAR function
See also Microsoft Excel Functions and Macros
description 178, 369
DVARP function
See also Microsoft Excel Functions and Macros
description 178, 370

Edit Clear command
array ranges, clearing 18
cells, clearing 195, 205-206, 233
charts, clearing 206, 336
data series, clearing 206, 336
description 205-206
formula bar, clearing 229
tables
clearing values 146
deleting 147

Edit Copy command
  array ranges, copying 18
  copying data
    between applications 207, 243-244
    specific cell attributes 118, 229
    within worksheet/to another worksheet 116-117, 207, 229
  data series
    copying from chart to chart 74-75, 123-124, 207
    copying from worksheet to chart 74-75, 207
  description 207
  formula bar, copying to 122, 207
  shifted version *See* Edit Copy Picture command
Edit Copy Picture command 208-209, 243
Edit Cut command
  copying data between applications 243-244
  description 210
  moving data in worksheets 210, 230, 485
Edit Delete command
  cells, deleting 195, 211, 233
  columns, deleting from worksheet 99, 195, 232
  description 211
  rows, deleting from worksheet 195, 232, 561
Edit Fill Down command 118, 212, 229
Edit Fill Left command 118, 212, 229
Edit Fill Right command 118, 213, 229
Edit Fill Up command 118, 213, 229
Edit Insert command
  blank cells, inserting into worksheet 214, 411
  columns, inserting into worksheet 99, 214, 232
  description 214
  rows, inserting into worksheet 99, 214, 232, 561
Edit menu commands, undoing 223
Edit mode 346, 586, 640-641
Edit Paste command
  data series
    copying from chart to chart 74-75, 123-124, 216, 217
    copying from worksheet to chart 74-75, 216-217
  description 215-217
  formula bar, copying to 122
  pasting data 116-117, 215-216, 228, 229, 482, 484
Edit Paste Link command 217-218, 434
Edit Paste Special command
  array ranges, converting to constant values 18
  copy area, combining with paste area 122, 230
Edit Paste Special command *(continued)*
  copying specific cell attributes 118, 219, 229
  data series 74-75
  description 218-221
Edit Redo command 224
Edit Repeat command 222, 224-225
Edit Undo command 223, 224, 340, 582
Editing
  See also specific type of editing
  array ranges 17-18
  cell contents 227
  chart text
    attached text 59, 88, 91, 234
    unattached text 91, 234
  charts 233-235
  data series 234
  databases
    data form procedure 130, 159-160
    guidelines 156
    restoring edited fields 132
  description 223
  documents 223-235
  features 251
  formulas 227-229, 346-347, 424-425
  message 586
  names 489
  notes 231, 355
  records
    data form procedure 130, 159-160
    guidelines 156
    restoring edited fields 132
  series formula 234-235, 578
  tables 146-147
  tickmark labels 62
  worksheets 225-233, 648-650
Ellipsis (. . .), dialog box notation 106
End key
  general use 418
  worksheet, moving in 644
Enter box 617
Enter key
  database, moving in 131, 159
  description 417
  general use 418
  pasting data into documents 215
  range, moving in 361
  similarities to/differences from Return key 3, 417
Enter mode 339, 586, 640

Equal sign (=)
  comparison operator 170, 338, 516
  formula symbol 337, 345
Erasing *See* Deleting
Error value
  See also specific error value
  alignment in cell 6
  array constant, using in 19
  description 24, 235, 598
  determining
    ISERR function procedure 371
    ISERROR function procedure 371
    ISNA function procedure 371
  entering into cells 637
  Lotus-1-2-3, conversion 447
  searching for/selecting 283, 353, 362
  sort order *See* Sorting
  troubleshooting 236-240
  types of error values 235-236
Escape key, canceling commands 418
EXACT function
  See also Microsoft Excel Functions and Macros
  description 375
Excel, Microsoft *See* Microsoft Excel 1.5; Microsoft Excel 2.2
Exchanging data between applications
  features 256
  methods 241-249
  specifications 256
Exiting
  Data Find 126, 128, 175
  data form 132, 160, 162
  Help 393
  Microsoft Excel 273, 553
EXP function
  See also Microsoft Excel Functions and Macros
  description 373
Expanded memory 258
Exponential powers 373
Exponential trend 374
Exponentiation operator 516
Exporting data *See* Exchanging data between applications
External reference
  description 249, 431, 577
  formula 431-434
  linking documents *See* Linking documents
  series formulas, using 577
External reference formula 431-434
Extract command *See* Data Extract command
Extract range
  clearing 177
  description 151, 176-177
Extracting records from database
  criteria *See* Criteria
  Data Extract command procedure 126-127, 176-177
  extract range
    clearing 177
    description 151, 176-177

F1 key, Edit Undo command shortcut 426
F2 key, Edit Cut command shortcut 426
F3 key, Edit Copy command shortcut 426
F4 key, Edit Paste command shortcut 427
F5 key, Formula Goto command shortcut 427
F6 key, moving among panes 427
F7 key, Formula Find command shortcut 427
F8 key, extending the selection 420, 427
F9 key, Options Calculate Now command shortcut 427
F10 key, activating menu bar 427
F11 key, File New command shortcut 427
F12 key, File Save As command shortcut 427
FACT function
  See also Microsoft Excel Functions and Macros
  description 373
Factorials 373
FALSE function
  See also Microsoft Excel Functions and Macros
  description 372
FALSE logical value 372, 442
Features 249-258, 472-474
Field
  blank fields, finding 170
  computed fields 151
  description 151
  maximum length 253
  maximum number per database 253
  moving among 130-131
  name 151, 152
  parsing *See* Parsing
  protected field 130
Field name 151, 152
File
  See also Document
  exchanging files between applications 244-249

File *(continued)*
formats *See* File formats
startup file 583-584
workspace file *See* Workspace file
File Close All command 258, 566
File Close command
Clipboard window, closing 607
description 259
documents, closing 259, 565-566, 626
shifted version *See* File Close All command
File Delete command 193, 196, 260-261
File formats
See also specific file format
converting between Microsoft Excel versions 1.5/2.2 474-476
copying data between applications, retaining formatting 243
default settings 187
opening documents with different formats 264
saving documents in other formats 245, 275-276, 563
supported file formats 256, 275-276
File Links command 262-263, 436-437
File management features 257
File New command
charts, creating 38, 263-264
description 263-264
documents, creating 263-264, 513
File Open command
description 264-266
documents
opening 264-266, 514
opening documents created in other applications 245
managing folders 288
File Open Mail command 266, 480
File Page Setup command
chart pages, setting up 270
column headings, displaying/hiding when printing 202, 329
description 267-270
footers, setting up 268-269, 328, 389-391, 541
gridlines, displaying/hiding when printing 31, 201, 269, 329, 541
headers, setting up 268-269, 328, 389-391, 541
margins, setting 269, 328, 541
page setup, controlling 267-270, 541-542
row headings, displaying/hiding when printing 202, 329
File Print command
charts, printing 54, 273
description 270-273
documents, printing 270-273, 546-547
Info window, printing 272-273, 409-410
File Quit command 273, 553
File Record Macro command 274
File Save As command
charts, saving 53
description 274-277
documents
naming 274-275, 514
saving 274-277, 562, 564, 654
saving in other file formats 245, 275-276, 563
retrieving document from memory 193, 261
File Save command
description 277
documents, saving 277, 562, 564
File Save Workspace command
description 278-279
saving workspace files 53, 278-279, 563, 656
File Send Mail command 279, 480
Fill commands *See* Edit Fill Down command; Edit Fill Left command; Edit Fill Right command; Edit Fill Up command
Filling in
Data Series command procedure 133-134, 600
Edit Fill Down command procedure 212, 229
Edit Fill Left command procedure 212, 229
Edit Fill Right command procedure 213, 229
Edit Fill Up command procedure 213, 229
Format Alignment command procedure 6-7, 292, 324
Format Number command procedure 307
Financial functions
See also Microsoft Excel Functions and Macros
listing of 370-371
FIND function
See also Microsoft Excel Functions and Macros
description 375
Finding *See* Searching; Searching/replacing
Finding records *See* Searching
Fixed decimal places, setting 428, 533
FIXED function
See also Microsoft Excel Functions and Macros
description 375
Folder 286-289, 438-439
Font
adding 530
applying *See herein* changing

Font *(continued)*
available fonts 290
changing
Format Font command procedure 290, 296-297, 324
row height changed automatically 290, 560
chart fonts
default settings 191
formatting 91-92, 291, 297-299
chart legend text, formatting 82, 336
colors, setting 290, 297, 530
default settings 187, 290
deleting 530
description 289
footer fonts, setting 269, 390
formatting guidelines 324
header fonts, setting 269, 390
maximum number per chart 254
maximum number per worksheet 252, 473
Microsoft Excel, versions 1.5/2.2, differences 473, 474, 476
name, description 289
printer fonts, installing 540
size
description 289
setting 296, 530
standard font
applying to cells 297
changing 291, 530
description 290
style
description 289
setting 297, 530
tickmark label, font setting 335
Font D/A Mover 530
Footer
alignment 268, 389
centering 268, 389
chart footer, default settings 191
creating 268-269, 328, 389-391
date, including in footer 268, 389
default settings 188, 388-389
description 388
formatting 268-269, 389-390
page number, including in footer 268, 390
setting up 268-269, 328, 389-391
time, including in footer 268, 389
Form *See* Data form
Format Alignment command
cell contents, aligning 6-7, 292
cells, filling in 6-7, 292, 324
description 292
Format Border command
borders
adding to worksheets 29-30, 293, 325
deleting 30
description 293-294
shading
adding to worksheets 29-30, 293
deleting 30
Format Cell Protection command 294-295, 550
Format Column Width command
columns
displaying hidden columns 100
hiding 99
width, setting 98-99, 295
description 295
Format Font command
chart legend text, formatting 82, 336
chart text fonts, formatting 92, 291, 297-299, 335
tickmark labels, formatting 335
worksheet fonts, changing 290, 296-297, 324
Format Justify command
description 299
justifying text 7-8, 299, 324
undoing 223
Format Legend command 81, 300
Format Main Chart command
charts
formatting 52, 76, 301-302, 332
type, specifying 51, 301
description 301-302
Format menu commands
formatting charts 49, 330
formatting worksheets 320
Format Move command
chart objects, moving 302
chart unattached text, moving 93, 334
description 302
Format Number command
colors take precedence over Format Font command settings 297
dates
built-in formats, applying 181, 182, 305, 322
custom formats, applying 184, 307-308, 322
custom formats, deleting 185

Format Number command *(continued)*
description 303-308
numbers
built-in formats, applying 303-305, 322, 506-507
custom formats, applying 305-308, 509
custom formats, deleting 197, 303, 509
tickmark labels, formatting 335
time
built-in formats, applying 322, 592-593
custom formats, applying 307-308, 322, 595
custom formats, deleting 596
Format Overlay command 308-310, 333, 537
Format Patterns command
arrows, formatting 58, 312, 314, 331
axes, formatting 64-65, 312, 332
chart area, formatting 56, 312
chart background, formatting 312, 333
chart legends, formatting 82, 313, 333
chart objects, formatting 310-314
chart plot area, formatting 83, 332
chart text, formatting 92, 313, 335
data points, formatting 75-76
data series, formatting 75-76
description 310-314
gridlines, formatting 332
series markers, formatting 332
tickmark labels, formatting 313, 332
tickmarks, formatting 313, 332
Format Row Height command
description 315
double underline, creating 30, 294
row height, setting 315, 326, 560-561
Format Scale command
axes, formatting 64-65, 315-318, 333
description 315-318
Format Size command
chart objects, sizing 318
chart unattached text area, sizing 94, 334
description 318
Format Text command
chart text, aligning 9-10, 92, 319, 335
description 319
Formatted text file format, Clipboard type identifier 256
Formatting
See also specific type of formatting; specific object to be formatted
charts 329-336
Formatting *(continued)*
displaying in Info window 398, 405
documents 320-336
worksheets 320-329, 650-653
Formula
array formulas *See* Array formula
canceling 340, 345
chart formula *See* Series formula
clearing from cells 205, 229
copying
between cells 118, 219, 229
into formula bar 122, 207, 347
data types allowed 338, 636
database, use in 153
description 337, 635
displaying in cell 199-200, 323, 523
displaying in Info window 398, 405
editing 227-229, 346-347, 424-425
entering formulas into cell
array formulas *See* Array formula
entering into multiple cells at once 118
procedures 339, 637
error value, entering into formula 637
external reference formulas 431-434
freezing values 34
functions, pasting into formula 228, 339, 356-357, 368
linking chart text to worksheet 89-91
logical value, entering into formula 637
Lotus 1-2-3, conversion 447-450
moving in 346
names
applying to cell references 341-343, 491-494
pasting into formula 228, 339, 357-358, 490
naming 350-352, 488
numbers, entering into formulas 504-505, 637
parts of a formula 337-338
references, entering into formulas 228, 347, 554
replacing with calculated value 32, 34, 228, 520
searching for 281-282, 354, 409
searching for/replacing 231, 359-360
selecting all cells containing formulas 283, 362
selecting in 346
selection, filling in 424
series formula *See* Series formula
starting character (=) 337, 345
table formulas 145
text, entering into formulas 589, 637

Formula Apply Names command
  applying names to all references 341-343, 491
  description 341-343
  undoing 223
Formula bar
  activating 347, 424, 633
  available commands 638
  basic information 344-345
  calculating 32, 34, 228, 520
  clearing 205, 229
  contents, deleting 347
  copying to 122, 207, 347
  cutting and pasting characters 210
  date, entering 347
  date formats, displaying 182
  default settings 192
  description 344, 617, 631
  displaying/hiding 203, 348, 533
  editing data in 227-229, 346-347, 424-425
  entering data 345
  Formula Goto command, using with 281
  moving in 346, 642-645
  pasting characters into 216
  selecting in 346, 642-645
  techniques 346-348
  time, entering 347
  undoing mistakes 637
Formula Create Names command 349-350, 489
Formula criteria *See* Criteria
Formula Define Name command
  criteria range, naming 168
  description 350-353
  names
    checking 25
    creating 350-353, 487-488
    deleting 196, 352, 489
Formula Find command
  description 353-354
  finding cells 230, 281-282, 353-354, 409
Formula Goto command 230, 281, 354-355
Formula menu commands 280
Formula Note command
  description 355-356
  notes
    creating 355-356, 499-500
    deleting 197, 356, 501
    editing 231, 355
    listing cells containing notes 231
    reading 231
    viewing 501
Formula Paste Function command 228, 339, 356-357, 368
Formula Paste Name command
  description 357-358
  names
    listing all defined names 25-26, 358
    pasting into formulas 228, 339, 357, 490
Formula Reference command 228, 358-359, 557
Formula Replace command
  description 359-360
  searching for/replacing data 231, 282, 359-360
  undoing 223
Formula Select Special command
  auditing worksheets 25
  constants, searching for/selecting 283, 361-362
  dependent cells, searching for 27, 285, 364
  description 361-364
  notes
    scrolling through 408
    searching for/selecting 231, 361
  precedent cells, searching for 27, 285, 364
  searching for data 230, 283-285, 361-364
  tables, selecting 146
Formula Show Active Cell command 365
Freezing column/row titles 227, 327, 524
Freezing formula values 34
Full menus
  description 105, 469
  displaying
    Chart Full Menus command procedure 80, 105
    Options Full Menus command procedure 105, 469, 525
Full precision 505-506
Function
  See also specific function; Microsoft Excel Functions and Macros
  arguments
    arrays, using as *See* Array argument
    description 366
    enclosure in parentheses 367
    maximum number per function 253
    types of arguments 367
  custom functions, maximum number per worksheet 253
  description 365
  directory 368-376
  macro *See* Function macro
  macro functions *See* Macro function

Function *(continued)*
pasting into formulas 228, 339, 356-357, 368
results, description 366
specifications 252
worksheet functions *See* Worksheet function
Function keys
command shortcuts 426-427
general use 418
Function macro 365, 455, 458-460
Future value, calculating 370
FV function
See also Microsoft Excel Functions and Macros
description 370

Gallery Area command 377
Gallery Bar command 378
Gallery Column command 379
Gallery Combination command 380, 535-536
Gallery Line command 381
Gallery menu commands
See also specific command
charts, formatting 47, 329
overriding custom formats 46, 52
Gallery Pie command 382
Gallery Preferred command 52, 383
Gallery Scatter command 383-384
Gallery Set Preferred command 52, 384
General alignment format 292
General number format 303
Graphic *See* Chart; Picture
Grayed command 106
Greater than or equal to sign (>=), comparison operator 170, 338, 516
Greater than sign (>), comparison operator 170, 338, 516
Gridline
chart gridlines
See also Chart object
adding to chart 63, 80, 332
default settings 191
deleting from chart 63, 80
description 42, 63
formatting 332
worksheet gridlines
colors, changing 202, 325, 524
default settings 188
printing display 31, 201, 269, 329, 541
screen display 31, 201, 325, 523

GROWTH function
See also Microsoft Excel Functions and Macros
description 374
Growth series 600

Header
alignment 268, 389
centering 268, 389
chart headers, default settings 191
creating 268-269, 328, 389-391, 541
date, including in header 268, 389
default settings 188, 388-389
description 388
formatting 268-269, 389-390
page number, including in header 268, 390
setting up 268-269, 328, 389-391, 541
time, including in header 268, 389
Heading *See* Column heading; Row heading
Heap space 473
Help
browsing through 394-395
closing 605
command Help information 104, 392-393
context-sensitive Help 392-393
custom Help 166
defined term 392
description 391, 645
displaying Help 392-395, 418-419
exiting 393
general information 393-395
jump term 392
Lotus 1-2-3 Help 395, 445, 605
message 586
moving in 394-395
starting Help 392-393, 418-419, 604-605
window 392, 612, 616
Help key, requesting Help 393, 418
Help window 392, 612, 616
Hi-lo lines
See also Chart object
line charts 76
main charts 302
overlay charts 310
Hiding
cells 295
column headings
printing display 202, 329
screen display 201, 327, 523

Hiding *(continued)*
columns 99
data *See* Protecting documents
formula bar 203, 348, 533
gridlines
printing display 31, 201, 269, 329, 541
screen display 31, 201, 325, 523
row headings
printing display 202, 329
screen display 201, 327, 523
scroll bars 203, 533
status bar 203-204, 533, 587-588
windows 605
zero values 200-201, 323, 524
Highlighting *See* Selecting
HLOOKUP function
See also Microsoft Excel Functions and Macros
description 373, 443-444
Home key, moving in worksheet 644
Horizontal axis *See* Category axis
Hour
converting serial number to 370
format symbols 307, 308, 594-595
HOUR function
See also Microsoft Excel Functions and Macros
description 370

Icon, document types 563-564
IF function
See also Microsoft Excel Functions and Macros
description 372
ImageWriter 541
Importing data *See* Exchanging data between applications
Independent variable *See* Category axis
INDEX function
See also Microsoft Excel Functions and Macros
description 373
INDIRECT function
See also Microsoft Excel Functions and Macros
description 371
Info Cell command 396
Info Dependents command 397, 406
Info Format command 398
Info Formula command 398
Info menu
See also specific Info command
displaying on screen 403
Info menu *(continued)*
example 103
menu bar 470
Info Names command 399
Info Note command 399
Info Precedents command 400, 406
Info Protection command 401
Info Value command 401
Info window
basic information 403
cell information, displaying 404, 407
cell protection, displaying 401, 405
closing 404
default settings 188
dependent cells, displaying 27, 397, 405, 406
description 402, 612, 615
formats, displaying 398, 405
formulas, displaying 398, 405
names, displaying 399, 405
notes
displaying 399, 405
scrolling 502
opening 403-404, 407, 608
page setup 269
precedent cells, displaying 27, 400, 405, 406
printing 272-273, 409-410
references, displaying 396, 405
searching for data 409
switching to/from document window 407, 608
tiling with other windows 406
use suggestions 403
values, displaying 401, 405
Information functions
See also Microsoft Excel Functions and Macros
description 371-372
Input cell 139
Input range *See* Database range
Insert command *See* Edit Insert command
Insertion point 412
INT function
See also Microsoft Excel Functions and Macros
description 373
Interest
calculating, IPMT function procedure 370
rates, what-if analysis 142-143
Internal rate of return, calculating
IRR function procedure 370
MIRR function procedure 371
Intersection operator 517

Investment
future value, calculating 370
interest *See* Interest
net present value, calculating 371
payments, calculating
NPER function procedure 371
PMT function procedure 371
PPMT function procedure 371
present value, calculating 371
rate of return, calculating 371
straight-line depreciation, calculating 371
sum-of-years' digits depreciation, calculating 371
IPMT function
See also Microsoft Excel Functions and Macros
description 370
IRR function
See also Microsoft Excel Functions and Macros
description 370
ISBLANK function
See also Microsoft Excel Functions and Macros
description 371
ISERR function
See also Microsoft Excel Functions and Macros
description 371
ISERROR function
See also Microsoft Excel Functions and Macros
description 371
ISLOGICAL function
See also Microsoft Excel Functions and Macros
description 371
ISNA function
See also Microsoft Excel Functions and Macros
description 371
ISNONTEXT function
See also Microsoft Excel Functions and Macros
description 372
ISNUMBER function
See also Microsoft Excel Functions and Macros
description 372
ISREF function
See also Microsoft Excel Functions and Macros
description 372
ISTEXT function
See also Microsoft Excel Functions and Macros
description 372
Italic format
conventions used in manual 3
footers, formatting 268, 389
headers, formatting 268, 389
Italic format *(continued)*
selection, formatting 297
standard font, formatting 530
Iteration
calculating worksheets 412-415, 521
canceling 111
convergence 111, 414-415
default settings 187
description 111, 204, 412
divergence 204, 414-415
example 413-415
Lotus 1-2-3, conversion 450
maximum number of 253
turning on/off 35, 412-413, 521

Jumping
cells, jumping to 230, 281, 354-355
Help, jumping in 392
Justifying text 7-8, 299, 324

Key
See also specific key; key combination
conventions used in manual 3, 417
sort keys *See* Sorting
Keyboard
commands *See herein* keyboard commands
conventions used in manual 3, 417
extended keyboard keys 417
features 428
keyboard commands
description 422
general patterns 417-418
list of 423-427
worksheets, moving/selecting in 419-422, 643
Keyboard indicator area 585, 587
Keypad 417

LaserWriter printer 540
Layout 267-270, 541-542
Left alignment *See* Alignment
Left Arrow key
See also Direction keys
chart window, moving in 43
insertion point, moving 412
scrolling text in dialog box 109

LEFT function
See also Microsoft Excel Functions and Macros
description 375
Legend *See* Chart
Legend commands *See* Chart Add Legend command; Chart Delete Legend command; Format Legend command
LEN function
See also Microsoft Excel Functions and Macros
description 366, 375
Less than or equal to sign (<=), comparison operator 170, 388, 516
Less than sign (<), comparison operator 170, 338, 516
Line
breaks 88, 89
chart *See* Line chart
chart lines
default settings 191
styles/weights, number of 254
styles/weights, setting 312
Line chart
blank cells, effect on plotting 68
creating 301, 309, 381
description 45
drop lines 76
formatting
Format Main Chart command procedure 301-302
Format Overlay Chart command procedure 309-310
Format Patterns command procedure 76, 310-313
Gallery Line command procedure 381
hi-lo lines 76
#N/A error value, effect on plotting 68
overlay chart default 56, 190
Linear series 599
Linear trend 374, 375
LINEST function
See also Microsoft Excel Functions and Macros
description 374
Linking
chart text to worksheet cell 89-91
charts to worksheets
automatic link 429
maximum number of links 254
documents *See* Linking documents
worksheets *See* Linking documents
Linking documents
database operations, performing 153-154
deleting links 440-441
dependent worksheet 431
description 429
external reference *See* External reference
external reference formula 431-434
guidelines 433-434
hierarchies 430
linked documents
opening/updating 262-263, 436-437
saving 435-436
maximum number of different linked worksheets 253
multiple folders, guidelines 438-439
networking 495
pasting links into formulas 339
procedure 217-218, 434-435
redirecting links 439-440
removing links 440-441
supporting worksheets
description 431
opening/updating 262-263, 436-437
use suggestions 429-430
List box description 107
LN function
See also Microsoft Excel Functions and Macros
description 373
Locking cells *See* Protecting Documents
LOG function
See also Microsoft Excel Functions and Macros
description 373
LOG10 function
See also Microsoft Excel Functions and Macros
description 373
Logarithm
calculating
LOG function procedure 373
LOG10 function procedure 373
chart axis, formatting 318
natural logarithm, calculating 373
LOGEST function
See also Microsoft Excel Functions and Macros
description 374
Logical functions
See also Microsoft Excel Functions and Macros
description 372
Logical value
alignment in cell 6
array constant, using in 19

Logical value *(continued)*
converting 599
description 442, 598
determining 371
entering into cells 637
entering into formula 637
Lotus 1-2-3, conversion 448
searching for/selecting 283, 362
sort order *See* Sorting
LOOKUP function
See also Microsoft Excel Functions and Macros
description 373, 443-444
Lookup functions
See also Microsoft Excel Functions and Macros
description 373, 442-444
Lookup table 442-444, 588
Lotus 1-2-3
Clipboard type identifier 256
converting to/from Microsoft Excel 445-453
Help information 395, 445, 605
terminology 452-453
LOWER function
See also Microsoft Excel Functions and Macros
description 375
Lowercase characters
converting to 375
names, use in 487

Macro
command macro *See* Command macro
description 454
function *See* Macro function
functions, use in macros 456
naming 353
overview 454-456
recording 274, 456-457, 461-465, 586
running 463
sheet *See* Macro sheet
shortcut keys 353, 428, 457, 462
tools 455-456
types 455
use suggestions 455
Macro Absolute Record command 461
Macro function
built-in functions, number of 252
description 456
Macro Record command 457, 461
Macro Relative Record command 462
Macro Run command 457-458, 463
Macro Set Recorder command 463-464
Macro sheet
See also Worksheet
creating new macro sheets 264
description 455, 464
functions, number available 255
window 614
Macro sheet window 614
Macro Start Recorder command 464-465
Macro Stop Recorder command 457, 465
MacWrite, transferring files to/from Microsoft Excel 245-247
Mail *See* Microsoft Mail
Main chart *See* Chart
Manual, description 1-3
Margin
chart, default settings 191
setting 269, 328, 541
worksheet, default settings 188
Marquee 115
MATCH function
See also Microsoft Excel Functions and Macros
description 373
Matching
criteria *See* Criteria
EXACT function procedure 375
lookup functions procedure 373, 443-444
Math coprocessor 387
Mathematical functions
See also Microsoft Excel Functions and Macros
description 373-374
Matrix functions
See also Microsoft Excel Functions and Macros
description 374
MAX function
See also Microsoft Excel Functions and Macros
description 374
MDETERM function
See also Microsoft Excel Functions and Macros
description 374
Memory
addressable memory 257-258
allocating additional memory to Microsoft Excel 473
available memory
displaying 4, 466
increasing 468
distribution 386
expanded memory 258
extra memory 386, 468

Memory *(continued)*
features 251
management 466-468, 473
reducing memory used 467-468
requirements 385
Menu
See also specific menu
bar *See* Menu bar
default settings 192
full menus *See* Full menus
short menus *See* Short menus
types 469
Menu bar
activating 104, 422
alternate menu key 104, 534
custom menu bars, maximum number active at one time 256
description 470, 617, 631
types 470
Message
area 585-586
Help information 392-393
listing of messages 585-586
Message area 585-586
Microsoft Excel, version 1.5 471-479
Microsoft Excel, version 2.2
background processing 386
exchanging data *See* Exchanging data between applications
features 249-258, 472-474
file format, Clipboard type identifier 256
Help *See* Help
information about, displaying 4
introduction 1-4
Lotus 1-2-3, converting to/from Microsoft Excel 445-453
manual, description 1-3
memory *See* Memory
networking 387, 494-497
Product Support 4
quitting 273, 553
running under Multifinder 386
specifications 249-258
starting 582-584
system requirements 385
using with version 1.5 474-476
Microsoft File, transferring files to/from Microsoft Excel 247-248
Microsoft Mail
description 479
Microsoft Mail *(continued)*
opening mail 480
sending mail 279, 480
starting up 266
Microsoft PowerPoint, transferring data to/from Microsoft Excel 248
Microsoft Word, transferring files to/from Microsoft Excel 245-247
Microsoft Write, transferring files to/from Microsoft Excel 245-247
MID function
See also Microsoft Excel Functions and Macros
description 375
MIN function
See also Microsoft Excel Functions and Macros
description 374
Minus sign (–)
arithmetic operator 338, 516
displaying in number 307
negative number, formatting 505
Minute
converting serial number to 370
format symbol 307, 594
MINUTE function
See also Microsoft Excel Functions and Macros
description 370
MINVERSE function
See also Microsoft Excel Functions and Macros
description 374
MIRR function
See also Microsoft Excel Functions and Macros
description 371
Mixed reference
changing to absolute/relative reference 228, 358-359
copying data, effect on references 112-114, 226
description 481
moving data, effect on references 226
using 556
MMULT function
See also Microsoft Excel Functions and Macros
description 374
Mnemonics 188
MOD function
See also Microsoft Excel Functions and Macros
description 373
Modes 639-642
Month
converting serial number to 370
format symbol 183, 307

MONTH function
See also Microsoft Excel Functions and Macros
description 370
Moving
cells
references, effect on 226, 482-484
to another place in worksheet 210, 230, 484-485
to another worksheet 230, 484-485
chart arrows 57
chart legends 81, 300
chart objects 44, 302
chart text 93, 334
chart window, moving in 43
data forms, moving in database 130-131, 159
dialog boxes 351
fields, moving among 130-131
formula bar, moving in 346, 642-643
Help, moving in 394-395
insertion point 412
tables 147
worksheet, moving in 412, 419-420, 421, 642-643
Multifinder 386, 473
Multiple selections
creating 117
description 485
moving among 283
naming 351
plotting charts 71-73
Multiplying (mathematics)
arrays 374
copy area and paste area 120-122, 219
DPRODUCT function procedure 178, 369
PRODUCT function procedure 373

N function
See also Microsoft Excel Functions and Macros
description 372
#NA error value
arrays, expanding with #NA 21
charts, effect on plotting 68
description 237
NA function
See also Microsoft Excel Functions and Macros
description 372

Name
capitalization, effect 487
checking names 25
column-oriented names 341-343
copying data, effect on 114
creating
Formula Create Names command procedure 349-350, 489
Formula Define Name command procedure 350-353, 487-488
defining *See herein* creating
deleting 196, 352, 489
description 24, 485
displaying in Info window 399, 405
editing 489
field names 151, 152
guidelines 350, 487
jumping to named range 230
length limitations 350, 487
listing
all defined names 25-26, 358
names containing active cell 26, 399
Lotus 1-2-3, conversion 448
maximum number per worksheet 253
pasting into a formula 228, 339, 357-358, 490
replacing references with names 341-343, 491-494
row-oriented names 341-343
selecting 341
separator characters 487
valid characters 487
Name command *See* Formula Apply Names command; Formula Create Names command; Formula Define Name command; Formula Paste Name command
#NAME? error value 238
Naming
cells
Formula Create Names command procedure 349-350, 488
Formula Define Name command procedure 350-353, 487
chart documents 53
columns 349-350, 489
criteria ranges 135, 168
documents
File Save As command procedure 274-275, 514, 654
guidelines 563-564

Naming *(continued)*
formulas 350-352, 488
guidelines 487
key naming conventions 3
macros 353
multiple names, procedure 349-350, 489
multiple selections 351
ranges *See herein* cells
relative references 490
rows 349-350, 489
values 350-352, 488
workspace file 279
Natural logarithm 373
Net present value 371
Network 387, 494-497
Normal file format 275
Not equal to sign (<>), comparison operator 338, 516
NOT function
See also Microsoft Excel Functions and Macros
description 372
Note
clearing from cell 195, 205
copying 118, 219, 229
creating 355-356, 499-500
deleting 197, 356, 501
description 498
displaying contents
Formula Note command procedure 231, 355
Info Note command procedure 399, 405
editing 231, 355
headings, default settings 188
listing cells containing notes 231, 355
multiple notes, creating 500
printing 272, 502-503
purpose 25
reading 231, 355
scrolling 408, 502
search area 354
searching for 231, 283, 361
selecting all cells containing notes 231, 283, 361
use suggestions 408
viewing 501
NOW function
See also Microsoft Excel Functions and Macros
description 370
NPER function
See also Microsoft Excel Functions and Macros
description 371
NPV function
See also Microsoft Excel Functions and Macros
description 371
#NULL! error value 238
Null menu bar 470
#NUM! error value 239
Num Lock key 104
Number
absolute value 373
accuracy 505
adding *See* Adding
alignment in cell 6
array constant, using in 19
averaging numbers
AVERAGE function procedure 366, 374
DAVERAGE function procedure 178, 369
built-in formats
applying 322, 506-507
examples 304-305, 507
listing 303
colors 308, 323, 508, 512
constant number
See also Constant value
defined 504
converting
text to numbers 376
to expected values 598-599
values to numbers 372
counting numbers
COUNT function procedure 374
DCOUNT function procedure 178, 369
custom formats
creating 305-308, 322, 507-512
deleting 197, 303, 509
decimal point
default settings 192
fixed decimal places, setting 428, 533
formatting 306
description 504
determining 372
entering into cells 505, 636-637
entering into formulas 504-505, 637
exponential powers 373
factorials 373
finding *See herein* searching for
formats
built-in formats *See herein* built-in formats
custom formats *See herein* custom formats

Number *(continued)*
formats *(continued)*
default settings 187
description 304, 508-509
General *See herein* General format
specifications 252
full precision 505-506
General format
description 303, 505
symbol 306, 510
logarithm *See* Logarithm
Lotus 1-2-3, conversion 448
maximum number, finding
DMAX function procedure 178, 369
MAX function procedure 374
minimum number, finding
DMIN function procedure 178, 369
MIN function procedure 374
multiplying numbers *See* Multiplying
percentages *See* Percent sign
picture 303, 506
Precision As Displayed option *See* Precision As Displayed option
precision to 15 digits 252, 505
random number, generating 373
rounding off
DOLLAR function procedure 375
FIXED function procedure 375
INT function procedure 373
ROUND function procedure 374
scientific format 306, 511
searching for
Formula Find command procedure 353-354
Formula Select Special command procedure 362
serial numbers *See* Serial number
series 133-134, 232, 599-600
signs
determining 374
specifying 505
size, longer than column width 97, 506, 638
sort order *See* Sorting
square root, calculating 374
text
converting text to numbers 376
interpreting numbers as text 589
thousands separator 306, 511
truncating 374
value translated into number 372
Number series 133-134, 232, 599-600
Number sign (#)
digit placeholder symbol 306
error value symbol 235
Number signs (###), column width inadequate to display data, symbol 97, 506, 638

One-input table *See* Table
Opening
documents
created in other applications 245
File Open command procedure 264-266, 514
linked documents 262-263, 436-437
maximum number open at one time 258
multiple documents at one time 278-279, 656
protected documents 265-266
Info window 403-404, 407, 608
windows, multiple windows in worksheet 326, 606, 621-622
workspace files 264, 656
Operand 515
Operation, order of operations 517
Operator
arithmetic operators 338, 516
comparison operator *See* Comparison operator
description 515
Lotus 1-2-3, conversion 449-450
reference operators 338, 517
text operators 338, 516
types of operators 338, 515
Option button 107
Option key combinations
Option + Enter, filling selection with formula 424
Option + Return, filling selection with formula 424
Options Calculate Document command
description 519
worksheets, calculating active worksheet 34, 519
Options Calculate Now command
description 519-520
formulas, replacing with calculated value 32, 34, 228, 520
shifted version *See* Options Calculate Document command
worksheets, calculating open worksheets 34, 519-520
Options Calculation command
automatic calculation, setting 33, 521
calculation options, setting 35, 520-522

Options Calculation command *(continued)*
description 520-522
iteration, setting up 412-413, 521
manual calculation, setting 33, 521
Precision As Displayed, turning on/off 35, 506, 521-522
remote references, updating 35
Options Display command
column headings
colors, changing 202, 325, 524
displaying/hiding 201, 327, 523
description 523-524
formulas, displaying in cell 200, 323, 523
gridlines
colors, changing 202, 325, 524
displaying/hiding 31, 201, 325, 523
row headings
colors, changing 202, 325, 524
displaying/hiding 201, 327, 523
values, displaying in cell 200, 323
zero values, displaying/hiding 200, 323, 524
Options Freeze Panes command
column/row titles, freezing 227, 327, 422, 524, 625
description 524
Options Full Menus command 105, 469, 525
Options menu commands
See also specific command
formating worksheets 321
Options Protect Document command
description 525-526
windows, protecting 526, 552
worksheet content, protecting 525-526, 550
Options Remove Page Break command 527, 543
Options Set Page Break command 527, 542-543
Options Set Print Area command 528, 547
Options Set Print Title command 528-529, 544
Options Short Menus command 105, 469, 529
Options Standard Font command 291, 530
Options Unfreeze Panes command 531, 625
Options Unprotect Document command 531, 551
Options Workspace command
description 532-534
formula bar, displaying/hiding 203, 348, 533
menu activation key, reassigning 104, 534
reference style, setting 202, 327, 533, 558
scroll bars, displaying/hiding 203
status bar, displaying/hiding 203-204, 533, 588
OR function
See also Microsoft Excel Functions and Macros
description 372
Outline format
footers, formatting 268, 389
headers, formatting 268, 389
selection, formatting 297
standard font, formatting 530
Output range *See* Extract range
Overlay chart
See also Combination chart
axis 60, 537
creating
Chart Add Overlay command procedure 56, 333, 535-536
Gallery Combination command procedure 380, 535-536
data series distribution *See* Data series
default settings 56, 190
deleting 79, 538
description 534
formatting
Format Overlay command procedure 308-310, 333, 536-537
Format Patterns command procedure 311
types, changing 380, 536
use suggestions 535

Page
break *See* Page break
footer *See* Footer
header *See* Header
layout 267-270, 541-542
number *See* Page number
previewing 53, 272, 545-546
setting up 267-270, 541-542
Page break
See also Page number
automatic page breaks 542
default settings 189
manual page breaks
deleting 527, 543
setting 527, 542-543
Page Down key
Data Find, scrolling in 175
databases, moving in 131
worksheets, moving in 645
Page layout 267-270, 541-542

Page number
See also Page break
footer, including page number in footer 268, 390
header, including page number in header 268, 390
Page preview 53, 272, 545-546
Page setup 267-270, 541-542
Page Setup command *See* File Page Setup command
Page Up key
Data Find, scrolling in 175
databases, moving in 131
worksheets, moving in 645
Paginating *See* Page break
Pane
freezing panes
procedure 227, 327, 524, 624-625
unfreezing panes 531, 625
maximum number per window 253
splitting window into panes 227, 327, 622-624
Paper size, orientation 541
Parentheses (( ))
displaying in number 307, 511
function arguments, enclosure 367
negative number, formatting 505
Parsing 132-133, 232, 601-602
Password
assigning
Chart Protect Document command procedure 84-85, 551
File Save As command procedure 276, 549
Options Protect Document command procedure 526
network protection 496-497
removing
Chart Unprotect Document command procedure 95, 551
File Save As command procedure 549
Options Unprotect Document command procedure 531
Paste command *See* Edit Paste command; Edit Paste Link command; Edit Paste Special command; Formula Paste Name command
Pasting
Command+V procedure 346
Edit Paste command procedure *See* Edit Paste command
Edit Paste Link command procedure 217-218, 434
Pasting *(continued)*
Edit Paste Special command procedure *See* Edit Paste Special command
Enter key procedure 215
paste area
combining with copy area 120-122, 219, 230
copying to multiple paste areas 116-117, 216, 229
defined 226, 482
selecting 115, 229, 484
Pathname 287
Patterns *See* Format Patterns command
Percent sign (%)
arithmetic operator 338, 516
numbers, formatting 306, 505, 511
Phone support 4
Pi, calculating 373
PI function
See also Microsoft Excel Functions and Macros
description 373
Picture
See also Chart
copying picture of chart/worksheet to Clipboard 208-209, 243
number format picture *See* Number
Picture format, Clipboard type identifier 256
Pie chart
creating
Format Main Chart command procedure 301
Format Overlay command procedure 309
Gallery Pie command procedure 382
description 45
single data series chart 45, 47, 382
slice, angle control 76, 302, 310
Plot area *See* Chart
Plotting charts
default settings 191
interpreting worksheet information 68-70
multiple selections 71-73
non-numeric values 68
overriding defaults 39-40
overview 67
plot order
argument 577
changing 235, 310, 537, 578
replotting 66
Plus sign (+)
arithmetic operator 338, 516
displaying in number 307
number, formatting 505

PMT function
See also Microsoft Excel Functions and Macros
description 371
Point mode 339, 347, 586, 640
Population variance, estimating
DVAR function procedure 178, 369
DVARP function procedure 178, 370
PowerPoint *See* Microsoft PowerPoint
PPMT function
See also Microsoft Excel Functions and Macros
description 371
Precedent cell
checking relationships 26
description 26, 285, 400
direct precedent cell 406
displaying in Info window 400, 405, 406
identifying 27
indirect precedent cell 406
searching for 27, 285, 364
Precision As Displayed option 35, 506, 521-522
Preferred chart format *See* Chart
Previewing
pages 53, 272, 545-546
records to be deleted 125
Print title
canceling 544
default settings 189
setting 528-529, 543-544
Printer 386, 539-541
Printing
ampersand in header/footer 268, 389
AppleTalk network 541
canceling 547
charts 53-54, 273
column headings 202, 269, 329, 541
column titles 528-529, 543-544
copies
default settings 189, 191
setting 271
cover page 271
default settings
charts 191
worksheets 188-189
documents 270-273, 546-547
examples 629
features 257
formatting guidelines 328-329
gridlines 31, 201, 269, 329, 541
horizontal orientation 329, 541
Info window 272-273, 409-410
Printing *(continued)*
network procedures 497
notes 272, 502-503
orientation
default settings 189, 191
setting 329, 541
page ranges 271
paper size 541
previewing 53, 272, 545-546
print area, setting 528, 547
print titles *See* Print title
row headings 202, 269, 329, 541
row titles 528-529, 543-544
sideways 329, 541
vertical orientation 329, 541
worksheets 271-272, 654
Product *See* Multiplying
PRODUCT function
See also Microsoft Excel Functions and Macros
description 373
Product Support 4
PROPER function
See also Microsoft Excel Functions and Macros
description 375
Protecting documents
cell protection
default settings 187
displaying in Info window 401, 405
Lotus 1-2-3, conversion 451
turning off 531, 551
turning on 294-295, 550
chart protection
turning off 95, 551
turning on 84-85, 551
default settings 187
document access protection 276, 549
document contents protection 294-295, 525-526, 550-552
locking cells *See herein* cell protection
Lotus 1-2-3, conversion 451
network guidelines 496-497
opening protected documents 265-266
password *See* Password
types of protection 548
window protection
hiding windows 605
turning off 552
turning on 526, 551-552

PV function
See also Microsoft Excel Functions and Macros
description 371

Question mark (?)
searching for 161, 170, 354, 604
wildcard character 135, 161, 170, 353, 602-603
Quitting Microsoft Excel 273, 553
Quotation marks, delimiting text in formulas 589

R1C1 reference style
absolute reference notation 5
description 557-558
entering into cells 558
relative reference notation 5, 558
setting 202, 327, 533, 558
RAND function
See also Microsoft Excel Functions and Macros
description 373
Range
See also Cell
maximum number of selected ranges 253
Range operator 517
RATE function
See also Microsoft Excel Functions and Macros
description 371
Read-only document 262, 265, 495
Read-write document 495
Ready mode 586
Recalculation *See* Calculation
Record
adding to database
data form procedure 160
guidelines 156
canceling changes 132, 160
deleting from database
all records at once 125
criteria *See* Criteria
Data Delete command procedure 125, 176
Data Form command procedure 131, 161
description 151
editing
data form procedure 130, 159-160
guidelines 156
restoring edited fields 132
extracting from database *See* Extracting records from database
Record *(continued)*
finding records *See herein* searching for
first blank record, scrolling to 131
matching *See* Criteria
maximum number per database 253
moving among 130-131, 159
restoring edited fields 132, 160
searching for
comparison criteria method 169-171
computed criteria method 171-172
Data Find command procedure 128, 174-175
data form procedure 132, 161-162
reverse order 174
setting up 153
transferring records to/from Microsoft Excel 247-248
Recording macros 274, 456-457, 461-465, 586
Redo command *See* Edit Redo command
#REF! error value 239
Reference
A1 reference style *See* A1 reference style
absolute reference *See* Absolute reference
changing types 228, 358-359, 557
circular reference *See* Circular reference
copying data, effect on references 226
default settings 192
deleting rows/columns, effect on references 226
description 554, 631
determining 372
displaying in Info window 396, 405
entering into formulas 228, 347, 554
information about, determining 371-372
inserting rows/columns, effect on references 226
Lotus 1-2-3, conversion 448
mixed references *See* Mixed reference
moving data, effect on references 226, 482-484
number of areas, calculating 371
R1C1 reference style *See* R1C1 reference style
relative reference *See* Relative reference
remote reference 35
replacing with name 341-343, 491-494
styles *See* A1 reference style; R1C1 reference style
Reference area 344-345, 617
Reference manual, description 1-3
Reference operators 338, 517
Relative reference
A1 reference style notation 5, 559
arrays, effect on 14

Relative reference *(continued)*
changing to absolute/mixed reference 228, 358-359, 557
copying data, effect on references 112-114, 226, 555-556
copying formulas, effect on results 556
description 5, 555, 559
entering 555
moving data, effect on references 226, 482-484, 555-556
naming 490
R1C1 reference style notation 5, 558, 559
replacing references with names 341-343, 491-494
Removing *See* Deleting
Repeat command *See* Edit Repeat command
Repeating
actions 222, 224-225
searches 282
text
filling in text *See* Filling in
REPT function procedure 375
REPLACE function
See also Microsoft Excel Functions and Macros
description 375
Replacing
See also Searching/replacing
references with names 341-343, 491-494
REPLACE function procedure 375
Reports 628-629
REPT function
See also Microsoft Excel Functions and Macros
description 375
Result
arrays *See* Result array
function results 366
Result array
displaying in array range 16
expanding/trimming the dimension 21-22
Retrieving *See* Opening
Return key
general use 418
similarities to/differences from Enter key 3, 417
Rich Text Format (RTF) 243
Right alignment *See* Alignment
Right Arrow key
See also Direction keys
chart window, moving in 43
Right Arrow key *(continued)*
dialog box, scrolling in 109
insertion point, moving 412
RIGHT function
See also Microsoft Excel Functions and Macros
description 375
ROUND function
See also Microsoft Excel Functions and Macros
description 374
Rounding off
DOLLAR function procedure 375
FIXED function procedure 375
INT function procedure 373
ROUND function procedure 374
Row
deleting
Edit Delete command procedure 195, 232, 561
effect on references 226
description 560
differences, searching for 362-363
filling in *See* Filling in
heading *See* Row heading
height
automatic adjustment 560
default settings 187
fonts, adjusting height for 530
returning to standard height 561
setting 315, 326, 560-561
specifications 252
inserting into worksheet
Edit Insert command procedure 214, 232, 410-411, 561
effect on references 226
naming 349-350, 489
number of rows in array, determining 372
numbers, determining 372
print titles *See* Print title
searching through 282, 354
selecting
keyboard procedure 419-420, 644-645
mouse procedure 643
sorting 136-138, 580-582
titles *See* Row title
ROW function
See also Microsoft Excel Functions and Macros
description 372
Row heading
colors, changing 202, 325, 524
default settings 188, 189

Row heading *(continued)*
description 631
displaying/hiding
printing display 202, 269, 329, 541
screen display 201, 327, 523
Row title
freezing 227, 327, 422, 524, 624-625
printing 528-529, 543-544
ROWS function
See also Microsoft Excel Functions and Macros
description 372
RTF 243
Running head *See* Header
Running macros 463

Saving
charts 53
custom date formats 185
documents
File Save As command procedure 274-275, 562, 564, 654
File Save command procedure 277, 562, 564
in different file formats 245, 275-276, 563
frequency 277
interrupting save, effect 277
linked documents 435-436
preferred chart format 53, 384
worksheets *See herein* documents
workspace file 53, 278-279, 563, 656
Scatter chart
See also Chart
blank cells, effect on plotting 68
creating
Format Main Chart command procedure 301
Format Overlay command procedure 309
Gallery Scatter command procedure 383-384, 571
description 46, 567, 568
#N/A value, effect on plotting 68
overlay chart, use as 309
plotting 568-571
series markers, formatting 76, 312
Scientific notation 306, 511
Scrapbook 242, 243-244
Screen display, controlling 523-524
Scroll bars
default settings 192
description 632
displaying/hiding 203, 533
Scroll Lock key 421
Scrolling
Data Find, scrolling in 175
Help, scrolling in 394, 428
notes 408, 502
quick scrolling 428
windows, scrolling in 421-422, 619-620
SEARCH function
See also Microsoft Excel Functions and Macros
description 376
Searching
arrays, searching for/selecting 283-284, 362
asterisk, searching for 161, 170, 354, 604
blank cells, searching for/selecting 283, 362
capitalization, effect on search 153
cells, searching for 230, 280-285, 353-354, 361-364
column differences, searching for 284, 363-364
data, searching for
See also specific type of data
procedures 230, 280-285, 353-354, 361-364
databases *See herein* records, searching for
dependent cells, searching for 27, 285, 364
direction 282
error values, searching for 283, 353, 362
extracting found records *See* Extracting records from database
FIND function procedure 375
Formula Find command procedure *See* Formula Find command
Formula Select Special command procedure *See* Formula Select Special command
formulas, searching for 281-282, 354, 409
Info window procedure 409
last cell containing data, searching for 364
logical values, searching for/selecting 283, 362
lookup functions procedure 373, 442-444
notes, searching for 231, 283, 361
numbers, searching for
Formula Find command procedure 353-354
Formula Select Special command procedure 362
precedent cells, searching for 27, 285, 364
question mark, searching for 161, 170, 354, 604
records, searching for
comparison criteria method 169-171
computed criteria method 171-172
criteria *See* Criteria
Data Find command procedure 128, 174-175
reverse order 174

Searching *(continued)*
repeating search 282
row differences, searching for 284, 362-363
SEARCH function procedure 376
search range, specifying 281
spaces, effect on search 153
text, searching for
FIND function procedure 375
Formula Find command procedure 353-354
SEARCH function procedure 376
wildcard characters 135, 161, 170, 353-354, 602-603
Searching/replacing
Formula Replace command procedure 231, 282, 359-360
REPLACE function procedure 375
SUBSTITUTE function procedure 376
Second
converting serial number to 370
format symbol 308, 594
SECOND function
See also Microsoft Excel Functions and Macros
description 370
Selecting
cells
Formula Goto command procedure 230, 281, 354-355
Formula Select Special command procedure 283, 361-364
keyboard procedure 419-420, 643-645
mouse procedure 572, 642-643
chart objects 42-44
chart plot area 43, 86
charts 43, 85
columns
discontinuous columns 98
keyboard procedure 420
mouse procedure 98, 643
fields, data form procedure 159
formula bar, selecting in 346
keyboard procedure 419-420, 643-645
mouse procedure 572, 642-643
multiple selections *See* Multiple selections
names in list box 341
paste area 115, 229
plot area 43, 86
rows
keyboard procedure 419-420, 644-645
mouse procedure 643
Selecting *(continued)*
tables 146
windows 618
worksheets
keyboard procedure 420, 645
mouse procedure 98, 643
Selection
description 572, 631
multiple selections *See* Multiple selections
types 572-573
Selection squares 44
Serial number
date serial numbers
converting 370
default settings 187
description 180
description 574
time serial numbers
converting time to 370
default settings 187
description 180, 591
Series
chart series *See* Data series
creating 133-134, 232, 599-600
Series formula
arguments 576-577
building 577-579
charts, creating from series formulas 578-579
creating 577-579
description 42, 575
editing 234-235, 578
parts of a series formula 71, 576-577
plot order arguments 537, 577
SERIES function 576
Series marker *See* Data series
Shading
adding to worksheets 29-30, 293, 325
default settings 187
deleting 30
use suggestions 28
Shadow format
charts, formatting 313
footers, formatting 268, 389
headers, formatting 268, 389
selection, formatting 297
standard font, formatting 530
Shift key
combinations *See* Shift key combinations
general use 418

Shift key combinations
Shift + Backspace, collapsing selection 420
Shift + Command + F, scrolling in Data Find 175
Shift + Command + H, repeating search 282
Shift + Command + Page Down, extending selection 645
Shift + Command + Page Up, extending selection 645
Shift + Command + Tab, moving among ranges 361
Shift + Direction keys, extending selection 419, 420, 644
Shift + End, extending selection 420, 645
Shift + Enter
database, moving in 131, 159
range, moving in 361
Shift + F1, requesting Help 426
Shift + F2, Formula Note command key combination 426
Shift + F3, Formula Paste Function command key combination 426
Shift + F5, Formula Find command key combination 427
Shift + F6, moving to previous pane 427
Shift + F7, Formula Find command key combination 427
Shift + F8, turning on Add 427
Shift + F9, Options Calculate Document command key combination 427
Shift + F11, File New command key combination 427
Shift + F12, File Save command key combination 427
Shift + Help, requesting Help 393, 418
Shift + Home, extending selection 420, 644
Shift + Page Down, extending selection 645
Shift + Page Up, extending selection 645
Shift + Spacebar, selecting rows 419
Shift + Tab
database, moving in 131, 159
range, moving in 283, 361
Shifted command 106
Short menus
description 105, 469
displaying
Chart Short Menus command procedure 86, 105
Options Short Menus command procedure 105, 469, 529
Shortcut keys
command/dialog box shortcut keys 423-427
function keys 426-427
macro shortcut keys 353, 428, 457, 462
Show Clipboard command *See* Window Show Clipboard command
SIGN function
See also Microsoft Excel Functions and Macros
description 374
SIN function
See also Microsoft Excel Functions and Macros
description 366, 376
Sine, calculating 366, 376
Sizing
chart arrows 57
chart objects 44, 318
chart text area 93-94, 334
chart text borders 319
charts 270
fonts *See* Font
Slash (/), arithmetic operator 338, 516
SLN function
See also Microsoft Excel Functions and Macros
description 371
Sorting
capitalization, effect on sort 153
procedure 136-138, 580-582
sorting keys
maximum number of 253
sorting data 580-582
undoing 582
Space
displaying in number 307, 511
effect on search 153
prohibited in names 350
reference operator 338, 517
removing from text 376
Specifications 249-258
Split bar
description 617, 632
removing window splits 624
splitting windows into panes 227, 327, 623
Splitting windows into panes 227, 327, 622-624
Spreadsheet *See* Worksheet
SQRT function
See also Microsoft Excel Functions and Macros
description 374

Square root, calculating 374
Standard deviation
  calculating
    DSTDEV function procedure 178, 369
    DSTDEVP function procedure 178, 369
    STDEV function procedure 374
    STDEVP function procedure 374
Standard font
  applying to cells 297
  changing 291, 530
  description 290
Starting Microsoft Excel 582-584
Startup file 583-584
Statistical functions
  See also Microsoft Excel Functions and Macros
  description 374-375
Status bar
  default settings 192
  description 584, 617, 632
  displaying/hiding 203-204, 533, 587-588
  keyboard indicator area 585, 587
  message area 585-586
  parts of the status bar 585
STDEV function
  See also Microsoft Excel Functions and Macros
  description 374
STDEVP function
  See also Microsoft Excel Functions and Macros
  description 374
Straight-line depreciation 371
Strikeout format
  footers, formatting 268, 389
  headers, formatting 268, 389
  selection, formatting 297
  standard font, formatting 530
String *See* Text
Style, font *See* Font
SUBSTITUTE function
  See also Microsoft Excel Functions and Macros
  description 376
Subtracting (mathematics), copy area from paste area 120-122, 219
SUM function
  See also Microsoft Excel Functions and Macros
  description 366, 375
Sum-of-years' digits depreciation 371
Summary chart 73
Supporting worksheet *See* Linking documents
SYD function
  See also Microsoft Excel Functions and Macros
  description 371
SYLK file format
  Clipboard type identifier 256
  saving in 276, 474, 475
Symbols, custom number format symbols 305-308, 510-512
Symbolic link format (SYLK)
  Clipboard type identifier 256
  saving in 276, 474, 475
System requirements 385

T function
  See also Microsoft Excel Functions and Macros
  description 372
Tab delimiter 265
Tab key
  database, moving in 131, 159
  dialog box, moving in 109
  Help, moving in 394
  range, moving in 283, 361
Table
  calculating, Automatic Except Tables option 33, 142, 521
  creating 148
  data table
    description 138, 588
    types 138
  Data Table 1 *See herein* one-input table
  Data Table 2 *See herein* two-input table
  deleting 147
  description 588
  editing 146-147
  formulas
    adding to table 146
    examples 145
  input cell 139
  lookup tables 442-444, 588
  Lotus 1-2-3, conversion 451-452
  maximum number per worksheet 253
  moving 147
  one-input table
    adding formulas to existing table 142-143
    creating 141-142, 148
    description 138, 513
    formulas 145, 146
    setting up 139-140

Table *(continued)*
selecting 146
two-input table
creating 144-145, 148
description 138, 597
formulas 145, 146
setting up 143-144
types 588
values
adding to table 146
clearing 146
TAN function
See also Microsoft Excel Functions and Macros
description 376
Tangent, calculating 376
Technical support 4
Telephone support 4
Terminate-and-stay-resident programs 468
Text
alignment in cell
See also Alignment
General option 6
array constant, using in 19
attached text *See* Chart text
chart text *See* Chart text
colors, setting 96, 323, 512
control characters, removing from text 375
converting
to expected format 598-599
to number 376
value to text 376
custom formats 307, 322, 508, 512
description 589
determining 372
entering into formulas 589, 637
fonts *See* Font
formatting
custom formats 307, 322, 508, 512
fonts *See* Font
justifying text 7-8, 299, 324
length
determining 366, 375
limitation for cells 589
Lotus 1-2-3, conversion 448
lowercase, converting to 375
repeating
filling in text *See* Filling in
REPT function procedure 375
Text *(continued)*
searching for
FIND function procedure 375
Formula Find command procedure 353-354
SEARCH function procedure 376
sorting *See* Sorting
spaces, removing from text 376
tickmark label *See* Axis
too long for column 97, 506, 638
unattached text *See* Chart text
uppercase, converting to 376
value translated into text 372
Text box 107
Text file format
Clipboard type identifier 256
comma/tab delimiters, choosing 265
saving worksheet in 245-246, 275
TEXT function
See also Microsoft Excel Functions and Macros
description 376
Text functions
See also Microsoft Excel Functions and Macros
description 375-376
Text operators 338, 516
Tickmark *See* Axis
Tilde (~), search character 161, 170, 354, 603
Tiling windows 406, 604, 625
Time
automatic formats 305
built-in formats
applying 322, 592-593
list of 305, 591
number of 252
troubleshooting 593
custom formats 307-308, 322, 594-596
entering into formula bar 347
footers, including time in footer 268, 389
headers, including time in header 268, 389
serial numbers
converting time to 370
description 180, 591
TIME function
See also Microsoft Excel Functions and Macros
description 370
TIMEVALUE function
See also Microsoft Excel Functions and Macros
description 370

Title
  chart titles 59, 98
  print titles *See* Print title
Transferring data between applications *See* Exchanging data between applications
TRANSPOSE function
  See also Microsoft Excel Functions and Macros
  description 374
Transposing
  arrays 374
  copied cells 119, 219
TREND function
  See also Microsoft Excel Functions and Macros
  description 15, 375
Trigonometric functions
  See also Microsoft Excel Functions and Macros
  description 376
TRIM function
  See also Microsoft Excel Functions and Macros
  description 376
TRUE function
  See also Microsoft Excel Functions and Macros
  description 372
TRUE logical value 372, 442
TRUNC function
  See also Microsoft Excel Functions and Macros
  description 374
Two-input table *See* Table
TYPE function
  See also Microsoft Excel Functions and Macros
  description 372

Unattached text *See* Chart text
Underlining
  commands, selecting 534
  double underline, creating 30, 294
  footers 268, 389
  headers 268, 389
  selection, formatting 297
  standard font, formatting 530
Undo command *See* Edit Undo command
Undoing
  actions 223, 224
  mistakes in formula bar 637
  sorting 582
Union operator 517
Up Arrow key
  See also Direction keys
  chart window, moving in 43
Up Arrow key *(continued)*
  database, moving in 131
Updating
  linked documents 262-263, 436-437
  remote references 35
UPPER function
  See also Microsoft Excel Functions and Macros
  description 376
Uppercase characters *See* Capital letters

Value
  constant value *See* Constant value
  converting values
    to expected format 598-599
    to text 376
  copying between cells 118, 219, 229
  counting, COUNTA function procedure 374
  description 597
  displaying
    in cell 199-200, 323
    in Info window 401, 405
  error values *See* Error value
  logical values *See* Logical value
  naming 350-352, 488
  number values *See* Number
  parsing imported values 132-133, 601-602
  searching for 281, 354
  translated
    into number 372
    into text 372
  types
    designated 597
    determining 372
  zero values *See* Zero values
Value axis
  attaching text *See* Chart text
  bar chart differences 61
  description 42
  formatting 64-65, 317-318, 335
  labeling 59
#VALUE! error value 240
VALUE function
  See also Microsoft Excel Functions and Macros
  description 376
Values argument 577
VAR function
  See also Microsoft Excel Functions and Macros
  description 375

Variance
  calculating
    DVAR function procedure 178, 369
    DVARP function procedure 178, 370
    VAR function procedure 375
    VARP function procedure 375
VARP function
  See also Microsoft Excel Functions and Macros
  description 375
Versions of Microsoft Excel *See* Microsoft Excel 1.5; Microsoft Excel 2.2
Vertical axis *See* Value axis
VLOOKUP function
  See also Microsoft Excel Functions and Macros
  description 373, 443-444

WEEKDAY function
  See also Microsoft Excel Functions and Macros
  description 370
What-if analysis 138-140, 143-144
Wildcard 135, 161, 170, 353-354, 602-603
Window
  activating 603, 606
  arranging multiple windows 406, 604, 625
  chart window *See* Chart window
  closing
    File Close All command procedure 258, 566
    File Close command procedure 259, 565-566, 626
  controlling 618
  creating windows 326, 606, 621-622
  data protection *See* Protecting documents
  description 609
  effective use of windows 610-611
  freezing panes *See* Pane
  Help window 392, 612, 616
  hiding 605
  Info window *See* Info window
  macro sheet window 614
  maximum number per worksheet 253
  multiple windows
    arranging 406, 604, 625
    opening 326, 606, 621-622
    viewing simultaneously 227, 621-622
  opening multiple windows in worksheet 326, 606, 621-622
  panes *See* Pane
  parts of a window 616-617, 630-632
Window *(continued)*
  scrolling 421-422, 619-620
  selecting 618
  splitting into panes 227, 327, 622-624
  switching between windows 428
  switching to/from Info window 407, 608
  techniques for using windows 618-626
  tiling 406, 604, 625
  unhiding windows 609
  worksheet window 612
Window Activate Window command 603
Window Arrange All command 406, 604, 625
Window Help command 392, 394, 604-605, 646
Window Hide command 605
Window menu 617
Window More Windows command 606
Window New Window command 326, 606, 621-622
Window Show Clipboard command 242, 607
Window Show Document command 407, 607
Window Show Info command
  description 608
  Info window, opening 403, 404, 407, 608
  switching between Info window/worksheet 407, 608
Window Unhide command 609
WK1 file format 276, 446
WKS file format 276, 446
Word *See* Microsoft Word
Worksheet
  alignment *See* Alignment
  auditing worksheets 24-28, 251
  borders *See* Border
  calculating *See* Calculation
  charts, linking to worksheet
    automatic links 429
    maximum number of links 254
  color *See* Color
  column *See* Column
  copying data *See* Copying
  creating new worksheets 263, 630
  data, moving in a worksheet 481-485
  default settings 186-189
  description 626
  dependent worksheet 431
  display options 198-202
  editing 225-233, 648-650
  features 250-251
  fonts *See* Font
  formatting 320-329, 650-653

Worksheet *(continued)*
formulas *See* Formula
freezing panes *See* Pane
function *See* Worksheet function
gridlines *See* Gridline
Info window *See* Info window
justifying text 7-8, 299, 324
linking *See* Linking documents
linking to charts
automatic links 429
maximum number of links 254
margins *See* Margin
moving in worksheet 412, 419-420, 421, 642-643
names
See also Name
description 632
naming 654
opening *See* Document
page setup 267-270, 541-542
printing *See* Printing
saving *See* Saving
selecting
keyboard procedure 420, 645
mouse procedure 98, 643
size, maximum 252
specifications 252-253
supporting worksheet *See* Linking documents
switching between Info window/worksheet 407, 608
Worksheet function
See also Microsoft Excel Functions and Macros; Function
directory 368-376
number of 252
overview 366
syntax 367
Worksheet menus
See also specific Worksheet command
designated 102
menu bar 470
Worksheet name 632
Worksheet window
description 612
parts of a window 630-632
Workspace file
default settings 192
description 278, 286, 655
display options 202-204
Workspace file *(continued)*
naming 279
opening 264, 656
saving 53, 278-279, 563, 656
Write *See* MacWrite; Microsoft Write

X-axis *See* Category axis
XY chart *See* Scatter chart

Y-axis *See* Value axis
Year
converting serial number to 370
format symbol 183, 307
YEAR function
See also Microsoft Excel Functions and Macros
description 370

Zero values
default settings 188
displaying/hiding 200-201, 323, 524

MICROSOFT PRODUCT ASSISTANCE REQUEST

Microsoft Product Support Services - Phone (206) 454-2030

Instructions

When you need assistance with a Microsoft product, call our Product Support Services group at (206) 454-2030. So that we can answer your question as quickly as possible, please gather all information that applies to your problem. Note or print out any on-screen messages you get when the problem occurs. Have your manual and product disks close at hand and have all the information requested on this form available when you call.

Diagnosing a Problem

So that we can assist you more effectively, please be prepared to answer the following questions regarding your problem, your software, and your hardware.

1. Can you reproduce the problem?
   ❒ yes ❒ no

2. Does the problem occur with another copy of the original disk of your Microsoft Software?
   ❒ yes ❒ no

3. Does the problem occur with another system (if available)?
   ❒ yes ❒ no

4. If you were running other windowing or memory-resident software at the same time, does the problem also occur when you don't use the other software?
   ❒ yes ❒ no

Product

Product name

Version Number

Registration Number

Software

Operating System

Name/Version number

Windowing Environment

If you were running Microsoft Windows or another windowing environment, give name and number of windowing software:

CD ROM Software

Name/Version number

Other Software

Name/Version number of any other software you were running when problem occurred, including memory-resident software (such as keyboard enhancers or print spoolers):

Hardware

So that we can assist you more effectively, please be prepared to answer the following questions regarding your problem, your software, and your hardware.

Computer

_____ _____
Manufacturer/model Total memory

Floppy-disk drives
Number: ❒ 1 ❒ 2 ❒ Other
Size: ❒ 3 1/2" ❒ 5 1/4"
Number of Sides: ❒ 1 ❒ 2
Density: ❒ Single ❒ Double ❒ Quad
Capacity:
5 1/4": ❒ 160K ❒ 360K ❒ 1.2 megabytes
3 1/2": ❒ 360K ❒ 400K ❒ 720K ❒ 800K
❒ 1.4 megabytes

System Memory

_____ _____
Manufacturer/model Total memory
(If using DOS, you can run CHKDSK to determine the amount of memory available. If using Apple Macintosh Finder, select "About The Finder..." from the Apple menu to determine the amount of memory available.)

Peripherals

Hard Disk

_____ _____
Manufacturer/model Capacity(megabyte)

Printer/Plotter

_____
Manufacturer/model

❒ Serial ❒ Parallel

Printer peripherals, such as font cartridges, downloadable fonts, sheet feeders:

_____
_____

Mouse
Microsoft Mouse: ❒ Bus ❒ Serial ❒ InPort™ ❒ Other

_____
Manufacturer/model

Boards
❒ Add-on RAM board

_____
Manufacturer/model

❒ Graphics-adapter board

_____
Manufacturer/model

❒ Other boards installed

_____
Manufacturer/model

Modem

_____
Manufacturer/model

CD ROM Player

_____
Manufacturer/model

Version of Microsoft MS-DOS® CD ROM Extensions:

_____

Network

Is your system part of a network? ❒ Yes ❒ No

_____
Manufacturer/model

What hardware and software does your network use?

_____
_____
_____

Microsoft Excel 2.2 for the Apple Macintosh
Please Tell Us How We're Doing

When you've become familiar with Microsoft Excel, please rate our educational materials, reference documentation, and other support materials and return this postage paid mailer. Thank you — your comments will help us produce a better documentation package.

1. Are the materials provided in this package appropriate to your experience level?

   Appropriate Too Elementary Too Advanced

2. Overall, how frequently do you use the following:

	Effective 5	4	3	2	Ineffective 1
Roadmap	☐	☐	☐	☐	☐
Getting Started	☐	☐	☐	☐	☐
Tutorial (on-line)	☐	☐	☐	☐	☐
Help (on-line)	☐	☐	☐	☐	☐
Reference	☐	☐	☐	☐	☐
Function and Macros	☐	☐	☐	☐	☐
Sampler (An Idea Book)	☐	☐	☐	☐	☐
Keyboard Template	☐	☐	☐	☐	☐

Other Comments _____

_____

_____

	Use Frequently 5	4	3	2	Use Rarely 1
Roadmap	☐	☐	☐	☐	☐
Getting Started	☐	☐	☐	☐	☐
Tutorial (on-line)	☐	☐	☐	☐	☐
Help (on-line)	☐	☐	☐	☐	☐
Reference	☐	☐	☐	☐	☐
Function and Macros	☐	☐	☐	☐	☐
Sampler (An Idea Book)	☐	☐	☐	☐	☐
Keyboard Template	☐	☐	☐	☐	☐

3. Which of the following did you use first?

   ☐ Roadmap
   ☐ Getting Started
   ☐ Tutorial (on-line)
   ☐ *Help (on-line)*
   ☐ Reference
   ☐ Function and Macros

4. Which of the following did you use to learn Microsoft Excel? (Choose as many as apply)

   ☐ Roadmap
   ☐ Getting Started
   ☐ Tutorial (on-line)
   ☐ Help (on-line)
   ☐ Reference
   ☐ Function and Macros
   ☐ Sampler (An Idea Book)
   ☐ Keyboard Template

5. Please rate the effectiveness and usability of the following features in the Reference

	Effective/Ineffective 5	4	3	2	1	Don't Use
Alphabetic organization of topics	☐	☐	☐	☐	☐	☐
Index	☐	☐	☐	☐	☐	☐
Main T.O.C.	☐	☐	☐	☐	☐	☐
Min-T.O.C. at the start of topics	☐	☐	☐	☐	☐	☐
Related info tables at end of topics	☐	☐	☐	☐	☐	☐
Core topics	☐	☐	☐	☐	☐	☐

6. When searching for a topic in the Reference, how quickly are you able to locate the information?

   ☐ One attempt
   ☐ 2 attempts
   ☐ 3 attempts
   ☐ Give up and use another method

7. How long have you been using a computer?

   ☐ Less than six months
   ☐ Six months to one year
   ☐ ____ years

8. What is your computer experience?

   ☐ First-time computer user
   ☐ Experienced with at least one other software package
   ☐ Programming experience

9. What is your experience with using electronic spreadsheets?

   ☐ First-time spreadsheet user
   ☐ Experience with at least one other spreadsheet package
   ☐ Experience with more than one other spreadsheet package.

10. What other computer programs, if any, have you used before? Please list them below.

    _____

    _____

    _____

11. What is your job title or professional field?

    _____

    _____

12. What are you using Microsoft Excel for?

    _____

    _____

    _____

Name: _____

Address: _____

City/State/Zip: _____

Telephone: (___) _____

tape here

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Microsoft® Excel 2.2 Update

Please note the following changes to the Microsoft Excel manuals.

Getting Started with Microsoft Excel

Page 23: Expenses Worksheet

The Expenses worksheet is located on the Microsoft Excel Program disk.

Page 26: Specifying the Criteria

The procedure on this page should include a fourth step:

4 Choose Data Set Criteria.	This defines the selection as your criteria range.

Microsoft Excel Functions and Macros

Page 200: CALCULATE.DOCUMENT

The CALCULATE.DOCUMENT macro function only works with worksheets and macro sheets. If you try to execute this macro function while a chart is the active document, Microsoft Excel returns a "Macro error at cell:" message.

Page 214: DISABLE.INPUT

The DISABLE.INPUT macro function is included for compatibility with Microsoft Excel for Windows. This function will not block keyboard and mouse input when it is used in Microsoft Excel macros for the Apple Macintosh.

Microsoft Excel Quick Reference Guide

Page 2: Note on Cell References in Formulas

There is no difference in the way Microsoft Excel versions 1.5 and 2.2 add cells when you click on them. Whenever you enter an equal sign and click on cells, Microsoft Excel automatically adds a plus sign between the cell references in the formula bar.

Page 5: Number Formats

The procedure under "To Format Numbers" is actually used to apply one of Microsoft Excel's built-in number formats. To create a custom number format, see the procedure in "Number" in *Microsoft Excel Reference.*

Microsoft Excel Reference

Page 104: Num Lock

Use Shift + Clear to turn Num Lock on and off.

Page 269: Footer Point Sizes

To specify a point size for headers and footers, use *&num* where *num* is a two-digit number. No quotation marks are necessary.

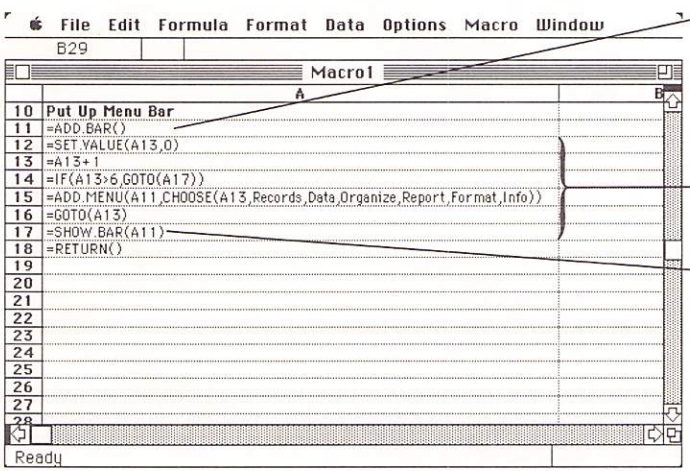
Microsoft Excel Sampler

Page 20: TIP

Microsoft Excel 2.2 doesn't automatically save the workspace in a Resume Excel document. Instead, you can save workspaces using the File Save Workspace command. The Workspace document records the name, position, and size for all open documents. When you double-click a workspace icon, Microsoft Excel opens, sizes, and positions all of the documents that were open when you saved the workspace. For more information on workspaces, see "File Save Workspace command" in *Microsoft Excel Reference.*

Page 56: Custom Menu Bar Macro

The illustration should appear as follows:



Creates a new menu bar, but does not display it.

Adds the six menus defined in the menu definition table.

Displays the custom menu bar.

This macro adds a new menu bar, adds the menus containing your macro commands to the bar, and then displays the new menu bar.

This macro uses a loop and named ranges on the menu definition table to create the custom menu bar. For an example of a simpler macro that creates the same custom menu bar, see the PAYROLLM document in the Sampler Files folder on your Help and Examples disk.

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Part No. 07648